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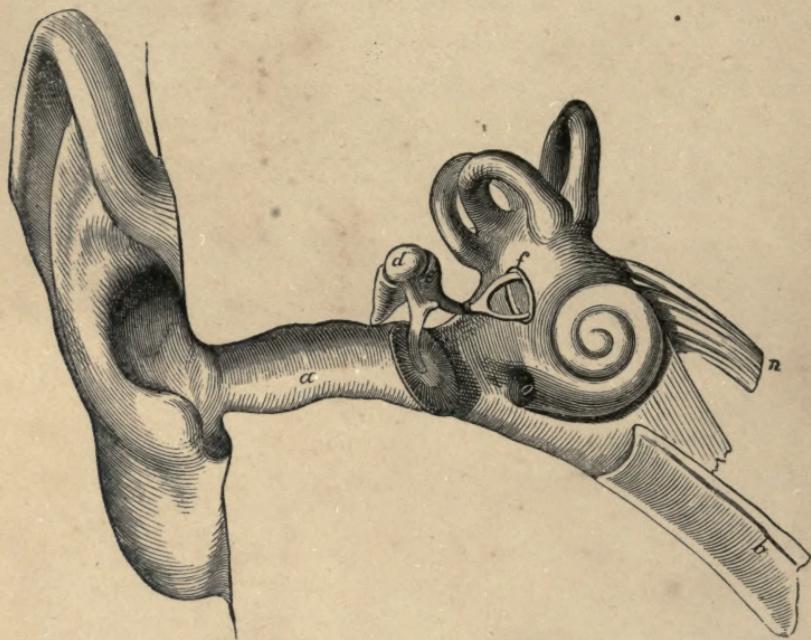
John T. Mackenzie
Jan. 1887

DISEASES OF THE EAR.

THE HUMAN EAR.

SHOWING THE MORE IMPORTANT PARTS OF :

1. The external ear and meatus, connected with the cutaneous system.
2. The middle ear and Eustachian tube, connected with the mucous system.
3. The labyrinth, the closed sacs of which receive the expansions of the auditory nerve.



Open or atmospheric divisions, suffering from various forms of disease.

a. Meatus externus.

{ Cutaneous Division, or external ear.

b. Eustachian tube.

d. e. f. Ossicula of tympanum arching between the m. typani and the m. fenestræ ovalis.

{ Mucous Division, drum, or middle ear.

Closed or shut-sac division, less exposed to the ordinary causes of disease.

g. Cochlea, with the vestibule, and semicircular canals, above it.

{ Nervous, or Sero-nervous Division, labyrinth, or internal ear.

n. Auditory nerve.

John S. Mackenzie
Guy's 1852

DISEASES

OF THE

E A R.

ILLUSTRATED BY CLINICAL OBSERVATIONS.

BY

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69926
31/5/56

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MDCCCLVII.



Sedert men begonnen is, bovenal *objectieve* ziekteverschijnselen op te sporen, is men niet alleen tot eene meer juiste diagnose der oorziekten geleid, maar kwam men ook tot *doelmatige* en *doeltreffende* behandelingswijzen.

Alleen de *objectieve* ziekte-verschijnselen hebben in de diagnostiek in het algemeen, en zoo ook in die der oorziekten in het bijzonder, een beslissende waarde. Waar zij niet opgespoord worden, dwaalt men ligt; waar zij ontbreken, daar is de diagnose altijd hoogst onzeker.—*Swaagman.*

TO

CHRISTOPHER RAWDON, Esq.,

MERCHANT OF LIVERPOOL,

Who, for more than half a century, has been ever ready to aid, in all that could elevate the condition, advance the interests, facilitate the intercourse, multiply the comforts, or lessen the sufferings of his fellow-men, and whose neighbours know the excellence of his urbanity and philanthropy, as distant lands do that of his mercantile name,

THESE PAGES ARE MOST RESPECTFULLY

DEDICATED,

BY A SINCERE AND VERY GRATEFUL FRIEND.

CORRIGENDA.

PAGE	LINE	FOR	READ
31	last	probable	forcible
40	12	Typhus	Typhus.
54	last	anachroid	arachnoid.
127	8	lapoid	lupoid
212	last	englarged	enlarged.
274	15	chorda tympani nerve	chorda tympani and facial nerves
371	16	organ	region
384	2	and sometimes	sometimes

PREFACE.

THE anatomy of the ear has long been well known, but the uses, or the modes of action of its different parts—until very lately imperfectly understood—even yet wait the advance of its physiology; for its pathology little had been done before the commencement of the present century, and hence the rational application of therapeutics in the treatment of diseases of the auditory apparatus is a department of the healing art which is comparatively new.

The methods of observation of diseases of the ear, as well as the optical, acoustic, and other instruments employed in their diagnosis, have been very much improved within the last ten years. Such improvements are of great practical importance; this branch of the healing art having been long retarded, or kept in its primary, or empirical state, for want of that

guiding light which can only be supplied by an established and scientific pathology.

With the advance of aural pathology, and the improved methods of diagnosis, the rational treatment of diseases of the ear has been gradually developed, while the various nostrums, chiefly of the stimulating kind, which were formerly dropped into the ear for the cure of all kinds of deafness, and this without distinction, are gradually disappearing: this disappearance, however, is slow, for ideas that have prevailed for centuries, and which, even for centuries, have been fraught with mischief, are not to be got rid of except by the gradual advance of knowledge, and require, too often, as well, the departure of one or more generations of men, who fondly cling to the remembrance and results of their early impressions, without taking the trouble to see in how many aspects they are erroneous, or in how many applications they do harm.

Systematic works on aural surgery are to be found in the more cultivated languages of Continental Europe, as well as in English, but

the want of clinical observations in this division of the art has been somewhat complained of; hence, it is hoped that the accompanying collection of facts may be received as one step towards the accumulation of a mass of clinical record, in connection with which, it need not be said, that both additions and improvements may be easily made.

While joining, to some extent, in allusions to the former neglect of aural medicine, and to the comparatively recent progress made in this branch of the healing art, it is well to bear in mind the considerable number of inquirers who have lately, and do yet distinguish themselves in this department of observation: were twenty names, in alphabetical order, to be mentioned, it would be difficult not to leave twenty more, with nearly equal claim to attention, amongst the anatomists, physiologists, and pathologists of France, Germany, England, and Ireland, who have lately thrown light on this important subject, and have lessened the sufferings of humanity by widening the boundaries of science.

Amid French names of this class, we have

Blanchet, Breschet, Deleau, Esser, Hubert-Valeroux, Itard, Meniere, Saissy, and Vaisse.

Amongst the numerous German names, those of Hyrtl, Frank, Kramer, Lincke, Müller, and Schmalz, are familiar to all who have paid any considerable attention to the physiology and pathology of the ear; while, amongst British names known on the European continent, those of practitioners who sustain the reputation of the metropolitan cities of these islands in connection with this interesting subject are too well known to require any mention. To this number let us add two names, chosen from a class of men never to be forgotten in enumerations of this kind—I mean the deaf and dumb—Allibert and Berthier, Deaf and Dumb Professors in the Imperial Institute of the Deaf and Dumb of Paris, prove by their eloquent discourses in mimic language that mind is not altogether dependent on hearing, and that genius may be displayed without speech. Castberg in Denmark, and Swaagman in Holland, should not be forgotten; the former, on account of his writings on deafness and deaf-dumbness; the

latter, for his beautiful and illustrated translation of the German work of Frank, and his treatise on the diagnosis of aural diseases, "Diagnostiek der Oorziekten," a production of the Groningen press.

In the study of deaf-mutism, and in that of the art of teaching the deaf and dumb, we are naturally led to considerations which relate to the philosophy of language, to the physiology of articulation, and to the mechanism and movements of the organs upon which speech depends; and one of the names mentioned above is that of Vaïsse, Professor in the Imperial Institute of the Deaf and Dumb of Paris, whose writings on speech, although indirectly connected with the subject of defects of hearing, will nevertheless be found of great value to all who take interest in the comprehensive study of deafness, mutism, and deaf-dumbness; practitioners, however, have enough to do with pathology, without betaking themselves to the wide domain of philology, and those who study profoundly the writings of Baillie, Hope, and Carswell, of Andral, Lebert, and Rokitansky, must be contented, in great

measure, to lay aside the charming productions of Adelung and Vater, of Gesenius and Ewald, of Court De Gebelin, Humboldt, and Bopp.

The engraving facing the title page (with the deeper parts magnified) may assist in remembering the form and relative position of different parts of the auditory apparatus, and may also suggest an anatomical basis for the classification of aural diseases; for the employment of this figure my acknowledgments are due to Mr. Renshaw, 356, Strand, London.

Some of the cases related in the following pages may be regarded as uninteresting; to such an objection the answer is, that of the grave maladies which attack the organ of hearing, many have very simple beginnings, and require their progress to be checked at an early period, by way of preventing their assuming those formidable types which may be afflicting in the ordinary, although "interesting" in the scientific point of view.

LIVERPOOL,

1ST JANUARY, 1857.

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PRELIMINARY REMARKS.

OUR consciousness of existence, and of the pleasures and pains associated with it, is, doubtless, determined, in the main, by the functions of the nervous system, of which the brain and spinal cord are regarded as centres, the nerves, generally, as circumferential or peripheric parts. A great proportion of the nerves distributed to the exterior of the body (to say nothing of motion), serve the purposes of what is called feeling—ordinary or general sensation ; but there is a small number of nerves, derived from the brain, which are destined for particular kinds of feeling ; they receive physical impressions, which give rise to the sensations, and ideas, of taste, smell, vision, and hearing, through the medium of two comparatively simple organs, the tongue, and nose, and of two highly complicated physical instruments, the eye and ear.

If we examine the organ of hearing in the animal series, passing gradually downwards from man towards

creatures regarded as low in the scale of being, we find the ear less and less perfect, or, in other words, it becomes gradually more and more simplified, until at last the extremity of the auditory nerve, protected by a soft pulp, and with a more or less delicate membrane encasing it, displays, as it were, the prototype, or most rudimentary form of the auditory apparatus.

In the human being, as well as in the higher vertebrata, the organ of hearing has three important parts:—1. an external ear and tube, to receive and transmit sound; 2. a middle ear, or drum, (communicating with the throat,) to modify sound, and carry it onwards to 3. the internal, or true ear, or labyrinth, which receives the expansion of the auditory nerve, through the medium of which it is connected with the brain: this part of the organ is essential to hearing; the other two parts to the perfection of hearing, as enjoyed by the higher animals.

Of the parts above mentioned, fishes possess only the first, reptiles and birds, the first and second, terrestrial mammalia, the first, second, and third; the organ being more and more developed as we ascend this division of the animal series.

Hence we may suppose that if diseases of the ear were studied in the vertebrate group generally, the simple organ of the fishes, or lowest division, would probably be found affected by few maladies ; the acoustic instrument of reptiles and birds, having already received important and delicate additions to the rudimentary mechanism, would be found more frequently to suffer, while the fully developed, finished, and perfected ear of the terrestrial mammalia, from its relations to the tegumentary covering of the body, to the mucous membrane, and to the atmospheric medium, as well as to external agents generally, is, of necessity, exposed to many and varied forms of disease and injury.

Diseases or malformations of the ear may occur before birth, or during the progress of the intra-uterine development of the foetus ; children so affected are often born completely deaf, and hence never acquire the power of imitating, or articulating language; which they have never been able to hear, so that the state of deaf-dumbness is their painful and inevitable lot.

After birth ;—in infancy, childhood, in the adolescent period, adult age, manhood, or old age, morbid

conditions of the auditory organ may occur ; affections of the external meatus, and middle ear, are common in the earlier periods of life, and by far the greater number of the cases of deafness met with in practice are derived from these sources, inasmuch as deafness solely depending upon morbid changes of the internal ear, or auditory nerve, is comparatively rare.

The deaf and dumb condition is not always a *congenital* defect ; it may be *acquired* in very early life, after hearing has existed, or even after both hearing and speech have been enjoyed ; this acquired form of deaf-mutism is met with after the loss of hearing at a very tender age, when speech has not long been practised, in other words, when language, hitherto but little, or imperfectly known, may be lost, along with hearing, the prolonged enjoyment of which is essential to the normal acquisition and development of the art of articulation.

It is of great importance to distinguish between congenital and acquired deaf-mutism, inasmuch as in the former case the hearing is scarcely ever improved, while in the latter it is, in some rare instances, capable of such amelioration as to allow of the regaining of speech.

If we carefully attend to the modes of origin, and to the nature and progress, of diseases of the ear, we cannot fail to see how much these maladies are associated with diseases of the general system on the one hand, or with local diseases affecting organs, or parts, in the vicinity of the ear, on the other.

It is more especially in connection with diseases of the skin, of the mucous membranes, and of the nervous system, that aural maladies arise, and this fact is in itself sufficient to show the importance of regarding them as a part of the great whole of medicine, and to suggest the necessity of constantly viewing their treatment in connection with the general principles of medicine and surgery, without, at the same time, underrating the importance of a speciality which takes charge of their more minute observation, and which has already done much to favour their progressive study.

The speciality of aural medicine and surgery should include much that relates to the study and treatment of deaf-mutism, or mutism depending upon deafness, and inasmuch as we occasionally meet with cases of mutism not associated with defects of hearing, it is well that they should receive some collateral attention,

were it only with a view to differential diagnosis ; on this account it has been deemed advisable, in the subsequent pages, to place a few cases of mutism after the series of cases of deaf-dumbness previously given.

To this class of cases of inability to speak without defect of hearing, the name *mutism* has been applied, the expression *deaf-dumbness* being employed to designate the state of want of speech which is linked with want of hearing ; some such distinction as this, seems desirable, in connection with this subject, were it only to keep our attention alive to the fact, that mutism, idiopathic mutism, not connected with any want of hearing, is now and then met with, and requires a special name in nosological arrangements.

It seems not inconvenient to commence the record of a series of cases of disease of the ear with the notice of a group in which the auditory organ has undergone important modifications from the loss of one, if not more divisions of the tympanic mechanism, by virtue of which the human ear is reduced to a condition more or less corresponding to that met with in some of the lower animals, or such as are only possessed of the more essential parts of the auditory

organ ; much more, however, of the human ear must be lost to render such analogy complete, for, in most of the cases to be noticed immediately, we not only have the external ear, and the greater part of the meatus, in normal condition, but the chain of ossicula, crossing the drum, may be left nearly *in situ*, or, if some of the small bones be lost, it is commonly those belonging to the more external part of the chain, such as a part of the malleus, the whole of this bone, or both the malleus and incus ; the stapes being frequently left *in situ* when the incus has been separated from its neck, to fall away with the malleus and the disorganised part of the membrana tympani.

This weak part of the chain of ossicula, which corresponds to the site of the os orbiculare, is hereafter alluded to as the part where this chain often breaks up, and here it may be premised that the strength of the connection of the base of the stapes with the membrane of the oval opening, and its protection by the surrounding bony margin or wall, contrasts, in a remarkable manner, with the fragile point above noticed.

Not only is the short stapes of the human subject very firmly connected with the membrane of the oval

opening, and hence, if we might so express it, very unwilling to leave this part, but even the columnella, or long representative or analogue of the stapes, (or of the ossicles, as a whole,) found in the ear of many reptiles and birds, is remarkable for the manner in which these parts hold together; a fact which is certainly very interesting, when we consider what the effect of an opposite state might have been, in which every fall, or every blow on the head, might have led to the dislocation of the loosely attached stapes, and hence to the injury or loss of hearing.

The small bones of the drum are frequently alluded to as the tympanic chain, or the chain of ossicles of the tympanum—expressions tending to give the idea that they hang loosely in the cavity which contains them, crossing it from side to side; such an idea, however, would be very erroneous, as is at once perceived by taking a view of these parts after the removal of that portion of the petrous bone which, as it were, roofs the tympanum and the mastoid cells.

The more or less vertical position of the main parts of the malleus and incus, the nearly horizontal position of the stapes, the mode of connection of the upper extremities of the malleus and incus—a sort

of mutual prop—to say nothing of the connection of the processus gracilis of the malleus with the Glasserian fissure, together tend to suggest the idea that the name, *chain of ossicles*, is not a very happy expression, as applied to this fabric of very delicate bone-work. For those who often look at the parts, and really know their mechanism, such a name may not be associated with any particular inconvenience, but for others, who rarely see the tympanum, or its contents, the expression, *chain of ossicles*, or *chain of bones*, might lead to the supposition that something really like a chain exists, and that, if it were broken, the severed portions would loosely dangle in the tympanic cavity—a notion found to be erroneous as soon as we see the position, form, relations, and connections of the ossicles, and the bony chamber in which they are lodged.

These considerations have an important bearing upon the state of parts which may exist after a portion of the membrana tympani, and often a portion, or the whole of the malleus, have come away, and should be especially borne in mind in connection with the application of the dossil of cotton, after Mr. Yearsley's plan, or the introduction of the "artificial

membrana tympani" of Mr. Toynbee, in those instances in which the employment of either may be resorted to, on account of perforation or loss of the membrane of the drum.

Certainly the skeleton of a finger, or of a toe, is more like a *chain* of bones than are the ossicles of the tympanum, the form and aspect of which would never remind the engineer of the chains of a suspension bridge, nor the mathematician of the catenary curve.

Deafness, associated with Perforation or Loss of the Membrana Tympani.

Many of the cases commonly called otorrhœa belong to this class, and it not unfrequently happens that the aural discharge, as well as the morbid condition of the meatus, of the tympanum, or of both, requires to be subdued before a clear view of the state of parts in the depth of the external canal permits a satisfactory diagnosis to be established.

Hence, it is easily understood that, in many cases of ear disease, where the deafness, hitherto, has only been observed to be connected with discharge from the

meatus externus, in other words, where an apparently uninteresting malady has attracted but little attention, chronic inflammation being subdued, morbid products removed, and their further accumulation prevented, most interesting pathological conditions may be observed, affecting the depth of the meatus and membrana tympani, perhaps also the lining membrane of the drum, and the ossicles contained in its cavity.

In the case of a lady now under my observation, and which was, until lately, one of otorrhœa on both sides, very curious appearances are met with, the mention of which may here be permitted as introductory to the group of cases of perforated membrana tympani.

On the right side there is a small aperture in the lower and anterior part of the membrana tympani, large enough to admit the end of a crow-quill, of elliptical figure, with a smooth and well defined edge; but although this opening exists, the patient is not able to send air through the tympanum to the exterior. On this side the audition is not much impaired, and the tick of a Geneva watch is perceived at the distance of twelve inches.

On the left side the greater part of the membrana

tympani is lost ; in its marginal remnant opposite points are seen, giving rise to an opening, which, at first sight, reminds us of the aspect of the Saxon cross, in church architecture. At the anterior part, one of these little projecting pieces has a portion of the malleus connected with it, and this portion of the malleus nearly touches the neck of the stapes, which is seen *in situ*, and in its normal position, the incus being lost.

The fenestra rotunda, closed by its membrane, is also seen, as well as the promontory between this and the oval opening. The remnant of the membrana tympani looks thick, and is of a dull white colour ; the lining membrane of the tympanum, which is well seen, in its reflections upon the remains of the malleus, upon the stapes, the fenestræ, and promontory, has a peculiar light grey colour, which might be compared to that we observe in the section of a piece of fresh cartilage.

As on the opposite side, air is not blown from the throat, by way of the tympanum, to the exterior. On this side the loss of audition is much greater than on the opposite, the tick of the watch being heard at a distance of two inches only.

On either side air entering the Eustachian tube in the act of swallowing is heard with the otoscope, although it cannot be propelled through the tympanum.

If it were possible, without injury to the parts, to place any small solid body between the stapes and the remnant of the malleus, an interesting observation might thus be made on a new condition of the auditory organ; the distance of these two bony pieces seems not to be more than the eighth or ninth part of an inch.

In such a case the possibility of the separated incus, or even of portions of the malleus, remaining in the tympanum, disturbing the Eustachian tube, or dropping into the mastoid cells, there to act as sources of irritation, is a consideration at least worthy of mention.

The different obturators for closing the opened tympanum were carefully tried on both sides, but without any effect, saving that of a slight diminution of audition, which varied more or less with the volume of the foreign body passed to the bottom of the meatus; in connection with this want of favourable effect from these agents, the fact that the patient could not practise perflation of the ear on either side

must be borne in mind. The small silver cornet improved the hearing, and with the ear trumpet the audition was painfully acute on both sides.

On the left side the piston action of the finger pressed closely into the meatus produced giddiness, apparently by driving the more or less confined air against the fenestræ on the opposite side of the tympanum.

In this instance it is obvious that the comparatively good state of the hearing is the result of the cure of otorrhœa, a serious amount of deafness having existed during the prevalence of the aural discharge.

For the complete observation of perforations in the membrana tympani, a well polished silver speculum is the most useful instrument, and as the tube of this instrument should occupy as little space in the meatus as possible, its size and form should correspond, as nearly as may be, with those of the aural canal ; hence the necessity of elliptical, and oval, and even of round tubes, each suited to particular cases.

A tube more flattened than usual is now and then serviceable, in cases where the meatus, by morbid action, is more narrowed in one direction than another.

The wide part of this instrument may, for some

cases, be much enlarged, and this with advantage ; a speculum, the funnel of which is as large as a wine-glass, is often more useful than those of a smaller size.

Large specula of this kind may be made of German silver, and it now and then happens that the moderate brilliancy of their interior is more convenient than the greater sheen of the more costly metal ; this is more especially the case when the meatus is very large, and the solar illumination very bright.

For the application of remedies to the depth of the meatus, to the perforated membrana tympani, or to the interior of the tympanum, by way of such perforation, glass specula, corresponding in size and form to the ordinary funnel-shaped speculum, are very useful, and are far more convenient than mere glass tubes.

SECTION I.

**Deafness, with loss of the Membrana Tympani.
Restoration of Hearing from the employment of
an Artificial Substitute.**

THE following case affords a remarkable illustration of the restoration of hearing, which is capable of being effected in some cases of deafness from perforation or loss of the membrana tympani. Cases of deafness, of this kind, may be very much alike, as far as the alterations of the membrane may be concerned, and yet differ very widely with regard to the nature and extent of the morbid changes which the deeper parts have undergone, so that the loss of audition experienced by patients is very different in degree, and the remedies which are found to be of the greatest use in one instance may be of little service in another. These remarks will be sufficiently illustrated by the various cases which follow.

J. H., *aet. 23*, a healthy-looking young man, of fair complexion, has been extremely deaf during the last twelve years: the tick of a watch closely applied to the ear is but faintly heard on either side; the affection is attributed to “cold,” and, from the account given of it, would not seem to have followed any exanthematous attack, or other complaint of which the patient has any knowledge or recollection.

When the deafness first came on there was discharge from the ear on both sides.

The loss of hearing occurring at the age of eleven years, education was much interfered with, and the sufferer, to use his own expression, became “very stupid and miserable; could not hear anyone speak; and used always to stay in the house.” This state of deafness, with otorrhœa, had prevailed during eight years, when a remedy for the evil was accidentally met with. A friend of the patient having found some relief to an affection of the ear from the instillation of olive oil, and the employment of cotton, these remedies were resorted to, and the effect produced was equally grateful and surprising; it was found that by passing a little pellet of cotton, moistened with oil, to the bottom of the meatus, that ordinary

conversation could be heard, and that with this help a state of comparative comfort was restored.

About four drops of warm oil are put into the ear, and a little cotton, previously soaked in oil, is pushed in after. After the oil has been dropped in, some improvement in audition is felt, but when the cotton is introduced, a much greater degree of hearing is immediately enjoyed.

The cotton being removed from the right meatus, this canal is seen to be free from any foreign body, and beyond it we see into the cavity of the tympanum, the lining membrane of which has a smooth, even, and moist appearance, and is of a pink colour, while the neighbouring part of the lining of the meatus is not so intensely red.

The contour of the bottom of the canal with which the membrana tympani ought to be connected, is clearly seen, and is distinguishable by the presence of a whitish line, which marks the situation where the membrane was formerly attached.

Connected with this line, and at its upper and back part, or where it corresponds nearly to the top of the meatus, is a well-marked, rounded, and white projection, which appears to belong to the chain of

aural ossicula, and may be regarded as the outer extremity of the remains of this chain, and this part seems especially worthy of notice in connection with the adaptation of the artificial substitute for the membrana tympani; and for the purpose of gaining information respecting the importance of this projection in connection with the use of the oil and cotton plug, the following question was put to the patient—

“ When you put the cotton in the bottom of your ear, with the help of the pin, do you find it necessary to be very careful in fitting it well at any particular part ? ”

The answer was:—“ Yes ; I have to be most particular about fitting it at the top.”

To determine whether the cotton is rightly placed, the patient, with his finger, rubs the inside of the meatus near its external part, as he would do to relieve tickling of the ear, “ to see what sort of a noise it makes,” and if he finds the right sort of sound to be thus produced, he contents himself with the result of his operation.

The patient sends air from the throat, so as to drive mucus through the tympanum into the external meatus on the right side, but cannot produce the

same effect on the left side ; and when the ears are syringed he does not feel the water go into the throat on either side ; nor does he succeed in attempting to send tobacco smoke through the meatus on either side — at least, these were the conditions noticed at the time of my first observation and examination of the case ; but with regard to such morbid states of the ear, it is absolutely necessary to bear in mind the fact, that the appearances, or physical signs of disease, differ very much at different times ; on one day air may be blown from the *right* Eustachian tube, through the tympanum, and to the exterior ; while on the *left* side the patient may not be able to produce the same effect, but on the following day the reverse may be the case ; so that to determine the true condition of parts with the least possible risk of error in diagnosis, frequent examinations must be made. We can easily understand how the varying conditions of the mucous membrane of the parts affected, as well as the more or less fluid, or hardened and dried state of secretions received or formed by the auditory apparatus, may help to account for the changing phenomena above alluded to, upon which vicissitudes of weather, especially when they produce catarrhal symptoms, often exert a well-marked influence.

In this case, the treatment accidentally adopted by the patient was peculiarly successful; for the moistened cotton, applied in the manner above described, has a more favourable effect on the improvement of hearing than is produced by moistened paper, or other form of "artificial membrana tympani."

The state of parts within or internal to the line of former attachment of the membrana tympani, as well as their condition external to this line, is a matter which it is important as accurately as possible to determine; and this leads us to the remark that the chances of success in the treatment of deafness, where the closing membrane of the external meatus has been perforated, are evidently in a great measure dependent on the condition of neighbouring parts, which the previously existing disease has left behind, for, in some instances, as we have seen, this state is such as to favour the effects produced by artificial moisture and plugging, while, in others, similar as far as the loss of membrana tympani may be concerned, but different in other conditions less seen or appreciated, the introduction of fluid or solid bodies into the external meatus is not followed by corresponding or favourable results, and, not unfrequently, it even increases the deafness.

The aperture in the membrana tympani may vary in size from the smallest possible perforation to the removal of the whole of the membrane, and along with this a portion or the whole of the malleus may be lost, to which loss that of the incus may be added, and in worse cases the tympanum is also deprived of the os orbiculare and stapes, and when such complete destruction of the bony chain occurs, other important alterations in the tympanic cavity are not always wanting ; such as thickening of its lining membrane, with general contraction of the parts—to say nothing of affections of the labyrinth — of disease of the temporal bone, or of the serious, cerebral, or other mischief, with which it may be associated.

In the case here related, extensive destruction of the membrana tympani had occurred on both sides, but this appeared to be nearly the limit of the affection, as the injury to the chain of bones was probably confined to its external extremity, and it seemed that a part, at least, of the malleus was observed both right and left. It cannot at present be determined what the precise state of parts may have been during the first eight years of the affection. The deafness, however, seems to have been extreme—even greater,

we might suppose from the patient's account, than it is now, when the aural stoppings are not introduced.

One very interesting feature of this case is seen in the fact, that the application of moisture to the bottom of the meatus, and to the tympanum and its contents, is alone sufficient to produce some improvement in the hearing. This suffices to remind us of the observation of M. Savart, who has shown by experiment, that tissue paper, when *wet*, "conveys vibration *better* than when *dry*; but as here, nothing more than the borders of the membrana tympani remain for the purposes of analogy with the tissue paper, we must endeavour, as it were, to follow the influences of the oil through the cavity of the tympanum, and to suppose that it, in some slight degree, affects the chain of ossicula, bearing more especially in mind the possibility of its exerting some influence on the membrane of the fenestra ovalis, which would of course be immediately carried to the labyrinth or essential part of the organ, there to tell upon the perception of sound; at the same time it must be admitted that the *modus operandi* of the moisture is not quite as clear as could be desired.

It is well known that in many (not in all) cases

of periodical otorrhœa, more or less regular, the deafness is much increased when the ear becomes dry, and that the hearing is sometimes improved by artificially moistening the parts, and that it is generally restored to its previous condition when the aural discharge returns; and also, that in some cases of ordinary catarrh, without any otorrhœa, but accompanied on the contrary by an unusually dry state of the membrana tympani, at least as far as the external and visible part is concerned, improvement in hearing is effected by dropping oil, or glycerine, into the external meatus in such way as to allow it to reach and moisten the membrana tympani, so that there are undoubtedly certain conditions of the aural surfaces in which benefit is effected by the application of moisture of particular kinds; but we are aware that every kind does not suit equally well: those substances which rapidly evaporate, so as quickly to leave a dry surface behind them, being less useful than bland and oleaginous matters, which yield more slowly to chemical or physical change; so that it is not difficult to understand how, in a case where the tympanum, charged more or less with muco-purulent secretion, being cleared by careful washing, and then moistened

by glycerine, or oil, an improved state of audition should follow; and it may be remarked that the patient whose case has just been related, finds his hearing improved by a few drops of oil at times, when—the cotton previously used having been removed, with the moisture it may have absorbed—a relatively dry, rather than a wet state of the ear prevails.

Deafness, with Loss of the Membrana Tympani on both sides. Hearing improved by treatment. Application of an Artificial Membrana Tympani.

WHEN a case of deafness is met with in practice, where the membrana tympani is perforated, and the state of parts is such that the introduction of foreign bodies to the bottom of the external meatus is not contra-indicated, the diseased surfaces having been cleared, and already sufficiently prepared for the trial, the tympanum should be closed externally by some suitable material, the size and form of which may be varied in accordance with the alteration which has taken place in the membrane itself, or in the deeper part of the meatus.

In many instances, this stopping, "artificial drum," or "artificial membrana tympani," as it has been called, will be found to increase the deafness, very much in the same way as normal hearing would be lessened if the same foreign body were passed into the meatus of the healthy ear; but, in a small number of cases, luckily suited for the practice, the hearing may be increased,—but little in some,—more in others.

The loss of part, or of the whole, of the membrana tympani, may be the main, or the only lesion; in such a case, an artificial substitute for the lost "drum-head"—if this expression be allowed—might be supposed capable of doing good; but little good, however, would be expected in the majority of instances, from the complicated character of the morbid alterations, as well as from the inability of art to create and adapt anything which, in structure or function, could very nearly resemble the living apparatus which has been lost. Such notices may serve to prevent us being disappointed with the results of the artificial closure of the tympanum, which will not always be very encouraging, but which, nevertheless, in exceptional cases, may produce very favourable effects.

June 21, 1854.—A. C., a female, æt. 19, has been more or less deaf from very early infancy, and about two years ago, without any known cause, the deafness began gradually to increase, and it has of late been worse than usual whenever the patient “has a cold.” Menstruation has been regular ever since the age of 14 years. The patient has a fair complexion and red hair, unlike her mother, who is of dark complexion, but in these respects resembling her father, whose elder brother was also very deaf. It is not known that any other relative has suffered in this way.

The membrana tympani is lost on both sides ; the patient can blow through the ears from the throat ; water poured into the meatus and concha receives bubbles of air from the Eustachian tube, and a solution of sulphate of copper dropped into the meatus is soon tasted in the mouth.

The patient, on one occasion, had the artificial membrana tympani in both ears during the whole day, and with benefit to audition ; the instrument requiring a little care to keep it in the right position.

One artificial membrana tympani employed in this case, was made of a small portion of thin leather,

through which a long and delicate pin (such as are used by entomologists) was passed ; the leather being kept close to the head of the pin by a small loop of silk passed through the one and around the other.

For want of a better apparatus, a very small wire shirt-button, with a pin to serve as a stalk, might be tried.

One form of Mr. Toynbee's artificial membrana tympani has the advantage of being forked, and supplied with a delicate ring, to keep up a certain amount of tension in the small disk of india-rubber or other flexible material intended to close the tympanum ; it was tried in this case, and its effect was much the same as that of the simple apparatus above named.

A solution of sulphate of copper, employed in this case, was continued during three weeks, being dropped into the ears every morning ; the hearing improved under its use—so much so that the patient was unwilling to take even the little trouble that the artificial membrana tympani gives for the sake of the additional hearing which she enjoyed from its introduction.

Cases are occasionally met with, in which, although

otorrhœa is not complained of, the lining membrane of the tympanum, Eustachian tube, and pharynx, is not in a healthy state, a condition of relaxation, congestion, and want of tone prevailing, for which the sulphate of copper, or the nitrate of silver, may be found a very useful application.

In many of the cases where the membrana tympani is, in part, or wholly, lost in early life, considerable narrowing of the deeper part of the meatus is found; in this instance, such a state of parts prevailed, so that we did not consider the case as one of the most favourable for the employment of the artificial membrana tympani.

Deafness, with Loss of the Membrana Tympani.

Hearing improved by Artificial Closure of the Drum.

FOR the examination of the membrana tympani, bright, or even intense, light, is always desirable, and this is more especially so, in cases where the aperture in the diseased membrane is very small, and where it is situated, as is often the case, at the anterior and

inferior part of the drum-head; for this part is now and then in some measure hidden from view, partly by the curve of the meatus itself, and partly from thickening of its lining membrane, near to its tympanal extremity.

In many cases of this kind, it is well to observe all we can with the aid of the speculum, and the good light above alluded to, rather than trust too much to modes of inquiry which are sometimes more painful, and occasionally less safe; and here allusion is made more especially to the practice of allowing the patient forcibly to drive air from the throat, through the tympanum, this being regarded as a possible source of additional injury to the delicate structures within or around the drum of the ear; for, although such an attempt may rarely do harm, in the normal state of the organ, it is easily understood, that, in some instances, where the connections of the ossicula have been weakened or destroyed by the progress of disease, a smart blast of air thrown upon the tympanic chain might be sufficient to break up its weakened connections, and if it should so happen that the accident tell upon the stapes, so as to cause its partial or complete separation from the membrane of the

fenestra ovalis, that which was previously a case of dullness of hearing only, may, all at once, become one of extreme or complete deafness; so that, at least, some caution is required in resorting to this mode of diagnostic inquiry.

In the following case of deafness, occurring in a very delicate female, the small aperture observed in one membrana tympani would not have been seen without the aid of a very good light, a good speculum, and a favourable position, but with the help of these it was easily diagnosed—its position, and size, and the aspect of its margin being clearly discerned.

July 7, 1854.—S. L., a female, æt. 25, complains of deafness, with tinnitus on the right side, and of “a strange feeling,” of what she calls light-headedness, and giddiness, when she stops the opposite ear with her finger; to the latter suffering or symptom she appears to attach much importance.

Four months ago she was perfectly free from every complaint of the right ear, but about three months ago, and when lactation was going on, she was in the habit of sitting when sewing, with her right ear turned towards the open door; she was attacked by right-side ear-ache, which was followed by tinnitus,

and in about a week from the commencement of the attack, otorrhœa occurred, with redness, and swelling of the external ear. On looking into the right meatus, this canal is found to have, as nearly as may be, its normal aspect at present, but the membrana tympani is perforated by a small aperture at its lower part, which would be covered by the extremity of a No. 5 catheter. Through this aperture air is blown from the Eustachian tube, its current being *audible* as it whistles across the drum of the ear, and the effect is *visible* in the dulled interior surface of the silver speculum which is employed for the observation.

A portion of cotton rounded into a small pellet, and moistened with oil, being applied to the aperture in the membrana tympani, the hearing was immediately improved, and the noise in the ear at once ceased.

The membrana tympani of the opposite ear is lost from a former attack of disease; and there was a little, but a very little, discharge from the ear, at the time the other was being poulticed, but the patient suffered no pain or tinnitus in the left ear, and the slight discharge scarcely attracted her attention.

Air cannot at present be forced through the left tympanum from the Eustachian tube, but the hearing

seems slightly, although slightly, improved by using the moistened cotton plug for the bottom of the meatus.

July 8.—The improvement produced by the employment of the cotton plug is lost when the pellet is displaced so as to get into the more external part of the meatus.

The light-headedness and giddiness felt when the better ear is stopped is yet much complained of.

A movement of pulsation in the right tympanum is observed ; it continues uninterrupted when the patient holds her breath ; is synchronous with the pulse at the wrist, and seems to depend upon the beating of a small artery upon the wall of the tympanum. It is worthy of remark, that although in many cases very grave symptoms attend the morbid processes which lead to the destruction of the tympanal membrane, it is not so in all ; in some instances the associated sufferings being comparatively mild ; of which the case here related supplies an illustration.

**Loss of the Membrana Tympani. Application of
an Artificial Substitute.**

September 2, 1854.—A. M., æt. 17, has been deaf about four years. Of the mode of origin of the deafness nothing very satisfactory can be ascertained; the patient says that her mother attributes it to frequent falls on the head.

In the amount of audition of the two sides there is no very marked difference; the patient requires a shouting voice to enable her to hear; the tick of the watch is heard on either side when held close to the ear, but two inches away it cannot be perceived.

The external meatus is contracted on both sides, more on the left than on the right; the membrana tympani is perforated at the lower part on the right side, and on the left this membrane seems to have entirely disappeared.

Oil was dropped into the meatus, on both sides, and its introduction was followed by decided benefit to the hearing. The oil was afterwards used in the same way from time to time, and with good effect.

This is a case of some interest; shewing how

disease of the ear may proceed, almost unnoticed, until even an important part of the organ be destroyed and lost; and yet we not unfrequently find this to have happened in cases where the membrana tympani is perforated or entirely carried away by ulceration.

Other cases have come under my notice, in which disease of the ear, accompanied by ulceration of the membrana tympani, has been attributed to blows, or falls on the head; when the patients are young, otorrhœa is generally complained of; when more advanced in years, this is not so frequently the case.

For the employment of an artificial membrana tympani certain conditions are desirable; such as the patent state of the Eustachian tube, and little or no otorrhœa; of these the case just related was fortunate in the latter, but not so in the former; nevertheless, the artificial membrana tympani was tried on both sides, and while it remained in the ear the audition was not materially affected.

If the external meatus be much narrowed, or somewhat altered in its direction, by the progress of morbid action, which has caused thickening of its lining membrane, the introduction of any artificial membrana tympani, in the form of a small disc of flexible material,

can no longer be practised in a satisfactory manner, as the substance is bent upon itself when pushed against the walls of the canal, and thus converted into a mere stopper for the meatus, by which the deafness in most cases is found to be increased.

**Deafness, with Loss of the Membrana Tympani
on both sides. Hearing improved by treatment.**

Ulcers on the extremities, or upon any other part of the body where the alteration of surface is easily seen, always attract attention, and it would be regarded as the height of negligence not to examine, cleanse, and dress them, at suitable and regular intervals, or to commit the oversight of not varying or modifying the treatment in accordance with the changing conditions of the diseased part, as morbid action passes from one stage to another: if this be important in the management of an ulcer of the leg, it is certainly not less so in that of an ulcer in the membrane of the drum of the ear, capable by its mischievous march of destroying the hearing, and, if it occur in very

early life, with deafness, the dumb state may also be associated, to say nothing of caries of the bones, or of diseases of the brain and adjacent structures, which may end the list of ills. Plain and true as this may seem, it is not less true that we often meet with patients who have suffered from ulceration in the ear for many years together, with the annoyance of discharge, often so foetid as to make their reception in society inconvenient, with gradual diminution of hearing, and paroxysms of great deafness on the occurrence of any catarrhal attack, and all this permitted to continue with the idea, perhaps, that it would be impossible to cure the deafness, and dangerous to stop the discharge.

In the following case considerable improvement was effected by very simple treatment, after serious disease of the ears had existed more than ten years.

June, 1854.—Master H. A., æt. 14, has been very deaf from very early childhood. The ticking of a watch applied closely upon the left ear is heard; three inches off it is inaudible; closely applied to the right ear it is also heard, but becomes inaudible when held at one inch distance.

The deeper part of the meatus is morbidly narrow, on both sides, and the membrana tympani on both

sides has been perforated by disease, so that air is blown from the throat into the external ear with ease on the right side, but requires a little more forcing on the left.

A muco-purulent otorrhœa is observed on both sides. The otorrhœa prevails on alternate days, affecting the right ear most on one day, and the left most on the next; and the patient states that his hearing is better when the ears run, and that when they get dry he can scarcely hear at all—the increased deafness being probably caused in part by altered and retained secretion. It is found that glycerine, or oil, dropped into the ear when deafness along with the dry state is complained of, immediately improves the audition; nevertheless, the attempt at restoration of the hearing by the employment of moistened cotton, or other substitute for the injured tympanal membranes, has not hitherto been attended with any benefit on either side.

June 3.—Air is blown more easily from the throat through the left ear to-day, while at the last examination it passed more readily through the right tympanum.

In these cases it would not be difficult, if we attended only to the sound produced by perflation, to mistake the

rushing of air through the opposite organ for noise produced in the one we are immediately inspecting, so that care on this account is required to prevent error in diagnosis.

June 12.—Air is blown easily through the right ear this morning, but the whizzing it causes is not at present produced on the left side.

In many such cases, the examination requires to be frequently repeated before the precise condition of the ears can be positively determined, as the accidental stopping up of the deeper part of the meatus, of the Eustachian tube, or of the tympanum between them, so as to prevent the air rushing completely through (be this from swelling of the mucous membrane, from the presence of granulations, or polypous growths, from ceruminous accumulation, indurated discharge, or other cause), might be sufficient to mislead us in diagnosis, if one examination only were made, while, on a subsequent occasion, the probably easy perflation of the auditory apparatus from the throat to the exterior, would show the defective condition of the membrana tympani.

July 18.—Perflation of the left ear from the throat is easy and complete, the air rushing through the

tympanum with loud noise to the meatus and exterior, while on the right side the attempt to blow through the ear only produces a slight movement in the mucus within the tympanum (which is visible when the speculum is employed), but noise is not heard.

Fluid being dropped into the left meatus, and the patient told first to hold his breath, and then to breathe forcibly, bubbles of air are seen to rise through the meatus, and to present themselves upon the surface of the fluid in the concha.

In this case considerable improvement of the hearing has been produced by constant attention to the state of the auditory passage on both sides ; careful washing out and syringing of this part with the decoctum quercus of the pharmacopœia having been practised three times a day for some weeks ; drops, with ten grains of sulphate of copper to an ounce of rose water, being at the same time employed night and morning ; the effect of this practice has been a more steady and even state of audition, so that the patient has been less distressed than before with the irregular exacerbations of his malady.

In cases of this class, local or aural remedies are far from being sufficient for the purposes of relief or

cure ; the state of the constitution must be attended to, and general treatment is commonly required ; to which the local treatment should be added, but *for* which it cannot be regarded as a substitute.

In this case, quinine, with dilute sulphuric acid, aided by fresh air and gentle exercise, with diminution of school duties and tasks, were decidedly useful.

Inasmuch as the deafness in such cases may be much increased, or become extreme, if the state of the organ is not carefully attended to, it is of the utmost importance that parents, tutors, or friends, should be informed about the fact that the *preservation* of moderate hearing is only to be effected by suitable care.

October 24, 1854.—The patient is no longer troubled with otorrhœa, and the hearing is very much improved, so much so that at present he does not consider himself deaf.

This case illustrates very well, how, in such instances, the hearing may be preserved and improved by suitable treatment and care. Had this young gentleman been neglected, as often happens to those who are deaf, in very low classes of society, he might soon have required very loud shouting to make him

hear, and the advancing injury to the deeper parts of the organ might have rendered the extreme deafness irreparable.

In this patient the artificial membrana tympani is rendered less easy of application from the diminution in the calibre of the deeper part of the meatus ; a healthy meatus, with some remains of the border of the tympanal membrane, being requisites of importance in connection with the adaptation of any instrument of this kind.

July 17, 1855.—The hearing remains good, and the patient is not troubled with otorrhœa.

Deafness, with Perforation of the Membrana Tympani. Recovery of Hearing.

When the cornea has once suffered from an inflammatory attack, when nebulous spots, or patches of complete opacity, are observed affecting its mucous, or serious surface, or the intervening and true corneal structure ; or connected, it may be, with all these parts at the same time ; an eye in such a state often suffers from successive attacks of the same disease,

and surfaces which formerly presented traces of opacity only may afterwards become the seats of ulceration, which, in its turn, may be the harbinger of more serious or destructive malady. In like manner, the membrana tympani may be thickened and opaque, in consequence of its first attack of disease ; some degree of deafness may also prevail, just as in the corneal affection dimness of sight attended the dull condition of the cornea ; the tympanic membrane, in such a state, becomes an easy prey to subsequent inflammatory affections, and this more especially in patients of weak or strumous constitution, or in those whose habits of life are irregular, or who are much exposed to atmospheric vicissitudes, to sudden and great changes in the temperature of the body, associated, probably, with laborious occupations, or with exposure to intense heat—as in glass manufactories, sugar refineries, &c.—or other causes, very numerous as they may be, which are likely to produce inflammatory, catarrhal, or rheumatic affections, and along with these aural and pharyngeal disease.

The second attack of inflammation of the ear may be unusually centred in the membrana tympani, the ulceration or destruction of which may be completed

before the patient gives any very serious attention to his malady, and thus a case of slight dullness of hearing may be all at once converted into one of extreme deafness, more especially if the affection occur on both sides at the same time.

The following case, to a certain extent, illustrates these remarks, and also shews how important are hygienic attentions to the organ of hearing, more especially where the lining membrane of the tympanum, or the membrana tympani itself, has once suffered from inflammatory action.

January 28, 1854.—J. H., æt. 37, a healthy looking young man, of light complexion, by trade a joiner, has been more or less deaf during the last ten years. On the right side he does not hear the ticking of a watch, unless it be closely pressed upon the auricle, on the left it is heard three inches off.

Ten years ago, during eight weeks, he was occupied night and day in certain chemical works, where he was surrounded by the "hot steam" which filled the place in which he was employed. During this time nothing occurred to his hearing, but in about a week after, and when he had been exposed for a week to the ordinary December atmosphere of the time, extreme

deafness came on, so that for a while he could not “hear the carts in the street.”

This deafness occurred without pain, and without otorrhœa, and for some years was, from time to time, increased by accumulation of cerumen, and then relieved by the use of the syringe.

Fifteen days ago he was exposed to the intense cold of a severe January morning—the earth deeply covered with snow—and has ever since suffered much from pain in the right ear, from which there has been a constant discharge of pale purulent matter; tinnitus has also prevailed during the same time, which is spoken of as a “ticking” and sometimes a “whizzing” noise.

The right membrana tympani is perforated, and air is blown from the throat, through the meatus, to the exterior, and it would seem that the purulent discharge is mainly supplied by the tympanum on this side.

February 6.—On retiring to bed this evening the otorrhœa still prevailed, but on February 7, in the morning, it had ceased, and on February 8 the outer part of the meatus looks dry, and air cannot now be blown through it from the throat, as before, owing, apparently, to alterations affecting the discharge,

accompanied, perhaps, by contraction of the parts concerned—alterations which will probably not be permanent, for on looking deeply into the right meatus, the perforated membrane of the tympanum is seen moistened with pus, although the meatus external to it is dry. The left meatus and membrana tympani have a natural aspect.

March 2.—The patient considers himself quite restored, saying that all he now feels of the affection is a somewhat less degree of acuteness of hearing on the right side. Since the last report there has been no otorrhœa. Air blown from the throat does not now reach the external ear on the right side.

The internal remedies employed in this case were—first, aperients, next, tonics; the local applications were—a seton to the nape of the neck, and frequent washing out of the meatus with warm water into which a little Goulard's extract had been dropped, with the occasional instillation of a weak solution of nitrate of silver. For cleansing the meatus the syringe was very carefully employed, as there was reason to believe that the structures belonging to the tympanum were not in a condition to resist any considerable shock from the probable injection of fluid.

In cases of this nature, where the membrane of the drum is destroyed, an imperfect ear must always exist, with a tympanum open to the influences of the atmosphere ; hence it is of great importance to explain to the patient the nature of the dangers to which he is exposed ; otherwise the good effects of treatment (which has been successful in removing a catarrhal condition, and the deafness connected with it) may be of short duration, while, with adequate care, they may be much more lasting.

In all such cases the open tympanum should be guarded by a small portion of cotton kept in the meatus, unless some other stopping more favourable to audition be discovered. The case is interesting, if only to shew how much of an approach to good hearing may be regained, even after destruction of the membrana tympani has taken place, provided catarrhal conditions be subdued, the aural apparatus kept free from all obstructions which are capable of being removed, the remains of the membrana tympani or the parts in its neighbourhood occasionally moistened when a too dry state prevails, the general health attended to, and the ear sufficiently guarded from injurious atmospheric, or other external influences.

In this case the pain, from which the patient at first suffered considerably, was much relieved by a remedy which, although apparently simple, or even trifling, has been thought worthy of separate mention. A small bit of lint, about the size of a grain of wheat, was well soaked in chloroform, then squeezed, and carefully rolled in a small portion of cotton, in such a way that fluid chloroform was not likely to pass through the cotton ; this little apparatus, if so it may be called, was next passed to the bottom of the external meatus, and left there ; the patient found, in the course of a few minutes, that his pain was soothed, and enjoyed the first “ comfortable day ” he had had during the last fortnight.

The intensity of the pain which is endured, in some cases of aural disease, is a sufficient reason for the combination of all rational means, great or small, which may be likely to alleviate the tortures by which the patient is often so much wearied and weakened.

Perforation of the Membrana Tympani; Otorrhœa; Head Affection, and Deafness, with Derangement of Health. Relief from general and local treatment.

November 7, 1854.—W. S., æt. 55, has been deaf, from time to time, after taking cold, during the last twelve months ; right side otorrhœa began a week ago ; on this side the meatus is filled with white muco-purulent matter, which, being washed out, a circular aperture about as large as the section of a No. 5 catheter is seen in the membrana tympani, through which the air rushes when blown from the Eustachian tube. On the right side the tick of a watch is not heard, even when closely pressed upon the ear ; on the left side it is barely heard in this position ; to hear what is said, the patient requires shouting. The soft palate and uvula are thickened, rough, and of a deep red colour, betraying the vestiges of chronic morbid action.

Tinnitus is complained of, and also “dizziness,” which is so great that the patient feels himself compelled to be accompanied by some one who may prevent him falling in the street, of which he has a constant

fear. The general health is in feeble condition, and the digestive organs out of order.

The posterior and lower part of the left membrana tympani is slightly depressed ; the anterior and upper part is pushed in to a much greater extent ; the outward projection of the malleus is the intervening boundary of these two divisions of the membrane.

A remarkable feature of the case is the occurrence of disease of the tympanum on the right side, which seems to have run its course with great rapidity, until ulceration of the membrana tympani took place ; this, at least, is probable, from the account given, inasmuch as the aural malady was regarded as of no importance, until the recent attack came on, and only troubled the patient when catarrhal affection prevailed.

November 24.—Frequent washing with tepid water, followed, after half an hour, by the instillation of a weak solution of nitrate of silver, which has now been steadily practised for some days, has lessened the otorrhœa, which is likely to be further corrected by the application of a stronger solution of the caustic with the camel's hair pencil.

December 9.—The otorrhœa is now scarcely perceptible, and the hearing is much improved ; the nitrate

of silver solution (20 grains to the ounce) having been pencilled on the affected parts, at the bottom of the meatus, every morning during the last fortnight. The patient now walks about by himself, no longer complaining of any head symptoms, the “dizziness” and fear of falling having left him; this general improvement seems, in great measure, due to a few alterative doses of blue pill and aloe, which he took at the commencement of the treatment, followed by the decoction of cinchona, with the solution of bi-chloride of mercury in very small quantity, during the administration of which the throat, the ear, and the general condition of the patient alike improved.

In cases of this kind, where otorrhœa prevails, filling the deeper part of the meatus with opaque matter—which hides its surfaces from view—a considerable amount of pains-taking and delicate manipulation are required to clear the parts completely from the white or yellow coating, which keeps their true anatomical appearances out of sight.

The employment of the syringe, with warm water, is often insufficient; granulations at the bottom of the meatus, sprouting, perhaps, in part from the tympanic surfaces, and crossing the site of the de-

stroyed membrana tympani, after even the most careful application of the syringe, may yet remain concealed by the thick discharge which coats their surfaces, and, in many cases, gives them a very white appearance ; this discharge, however, being removed, florid red granulations are seen, filling, perhaps, the whole of the meatus at its deeper extremity, and yielding at some point (this being often at the lower part) to air blown by the patient from the throat, and through the ear, to the exterior.

To clear, and to expose the red surfaces of such granulations, fungoid, or polypous growths, as they are sometimes called, requires great nicety of manipulation, without which, in many patients, the operation is altogether impracticable, on account of the irritability of the sufferer, or the extreme sensitiveness of the surfaces concerned. The forceps used for the purpose should be so formed as to occupy little more space than a common probe, and the portion of cotton with which they are armed should be exceedingly small, so that it may reach the very bottom of the meatus without rubbing against its sides, which, in many instances, are exceedingly sensitive within the bony or deeper division of the auditory tube ; so much so,

that the fleshy abnormal growth, will often bear rubbing, or wiping, better than the normal surface near to it; so that in a case where the deeper part of the canal is not much contracted, and where there is room to turn the little instrument here employed, it is well to be able to do so without hurting the patient by its lateral friction in the canal, and this can only be done by arming it with a small and compact charge of cotton, or some other suitable substance.

Trifling as such directions may appear, they are of great importance in the diagnosis and treatment of diseases affecting the deeper part of the meatus, the tympanum, and its membrane, for the complete exposure of florid red granulations on the external part of the drum, where the membrana tympani has been destroyed, will often suggest the use of therapeutic agents which we should not have thought of employing had the fleshy growths in question remained concealed from view in the manner they often did when the physical diagnosis of aural diseases was less advanced, the otoscope unknown, and the speculum but little employed.

Deafness. Loss of Left Membrana Tympani.

November 28, 1853.—H. C., æt. 35, says he “had a gathering” in his left ear, when a boy; that he has ever since been deaf on the left side, with discharge from the left ear occurring from time to time. He is occupied in the fish market, and thus much exposed to atmospheric changes, from the effect of which he seems to have become deaf on the right side, about twelve months ago.

The patient hears the tick of a watch closely applied with the right ear, distinctly, and faintly, even at the distance of about two inches; but cannot hear it at all with the left ear, where the membrana tympani is lost. The tympanum is inflated on both sides. The left side meatus is very large, but the right is much narrowed by sinking of the cartilaginous auricle into a fold which half closes the opening near its commencement. The right membrana tympani is opaque. There was formerly a sort of fungous growth or sprouting of red granulations in the deeper part of the left meatus; such a state seems occasionally to affect both the size and form of the meatus, and in

this instance the magnitude of the canal appears to have been increased by a morbid condition which has now passed away.

In this case it seems not unlikely that the deafness is associated with anatomical changes in the deeper parts, incapable of being much affected by remedial agents. A slight improvement in hearing is produced by passing a short section of the barrel of a large quill into the orifice of the meatus, so as to free this from the valvular closing caused by the depression of the auricular cartilage.

**Typhus Myringitis. Loss of Membrana Tympani.
Deafness.**

April 4, 1855.—T. S., a man of 29, is extremely deaf on the left side, where the bottom of the meatus is filled up by red granulations, from the neighbourhood of which a discharge at times oozes; this state of things followed an attack of typhus fever—from which the patient suffered about eleven years ago—and has ever since prevailed.

On the left or deaf side the inflation of the tympanum is more plainly heard than on the right, where the hearing is good. On the affected side the membrana tympani appears to have been destroyed by ulceration.

This case is noticed on account of its importance in connection with practical medicine; it shows the necessity of attending to aural affections during the progress of fever, and of bearing in mind that deafness is not always a "good sign" in the course of maladies of this kind. It is not improbable that the employment of a suitable local treatment, which need not have interfered with the general progress of the febrile ailment, might have averted the destructive action, which in this case has so seriously damaged the organ of hearing.

In a case of typhus fever, in a strong young woman of 25, which lately came under my notice, great deafness prevailed; on examination with the speculum, the membrana tympani was found intensely red on both sides; by leeches applied in front of the ears, the deafness, and head symptoms generally, were much relieved, and the patient recovered from the attack without retaining any trace of aural disease.

Destruction of Right Membrana Tympani.

March 9, 1855.—C. Q., æt. 30, suffers from extreme deafness. About fourteen years ago he became somewhat deaf, but during the last fourteen months he has required the loudest shouting to make him hear.

On examination, the right membrana tympani is found to be destroyed. It is probable that this structure has suffered from some form of disease for several years back, and that a new attack of otitis led to its ulceration and destruction about the time when the extreme deafness came on. A slight otorrhœa on the right side prevails.

This case illustrates the manner in which a new attack of aural disease, such as inflammation of the membrane of the tympanum, before, perhaps, opaque and thickened, so as to cause some degree of deafness, may soon lead to a nearly total abolition of the function of hearing. The patient attributes the more recent alterations, and the extreme deafness, to frequent exposure to cold and damp.

Loss of Membrana Tympani. Deafness.

December 19, 1853.—J. H., a boy of 16, is deaf on both sides—hearing the ticking of a watch distinctly when placed close to either ear. If the watch be removed from the right ear about half an inch, its tick becomes nearly inaudible, but on the left side it is heard two inches off. Inflation of the tympanum is heard on the left side, but not on the right.

In the bottom of the left meatus a rounded red mass of polypous granulation covers the site of the membrana tympani; the right membrane, although visible, is opaque, white, and moist. Otorrhœa has prevailed in the left ear ever since the age of two years, ceasing now and then, but yet never being completely absent so long as a week together: it would not seem to be profuse, as the night cap is never stained by it. At two years of age he fell from a table, and injured the back of his head by the fall: the aural affection has existed ever since: in other words, this is the only cause which the patient can assign for it.

January 20, 1854.—On a second examination of the right meatus it is found that air is blown into

it also from the corresponding Eustachian tube, and the aperture is seen at the lower part of the membrana tympani. On the right side the hearing distance for the tick of a watch is not altered, but on the left it is increased from two to six inches since the arms were blistered and a solution of the sulphate of copper dropped into the ears.

January 29, 1854.—Hearing distance the same as at the time of last report.

February 19.—The hearing has further improved since the last notice, and the muco-purulent collection at the bottom of the meatus is lessened.

When the patient blows air and mucus from the Eustachian tube into the tympanum, the deafness is much increased for some minutes—an occurrence to be accounted for, perhaps, by the effect produced upon the labyrinth, on the walls of which the moving fluids strike; and as the membrane of the fenestra ovalis may also be perforated, the possible entry of air, mucus, or pus, within the serous system, or canals of the internal ear, is not to be lost sight of.

The throat appears quite healthy, and the nasal and dental systems are equally so. The patient complains of occasional frontal headache, which compels him to wear his hat in a very easy manner.

February 25.—On careful examination this morning it is found that appearances in the bottom of the left meatus have changed considerably; the red granulations or rounded and polypoid looking masses have disappeared, so that when the part is examined after the use of the syringe, a light yellow surface is seen where the glistening membrana tympani should be, and through a part corresponding to the lower and anterior portion of the membrana tympani, air is blown from the Eustachian tube.

In this case hearing was not improved by the employment of the artificial membrana tympani.

Deafness. Ulceration of the Membrana Tympani.

That which might be regarded as very slight exposure to cold is often sufficient to lead to inflammation, ulceration, and even complete loss of the membrana tympani. Those who keep the ear turned to the cold air, as at small doors, or windows, while the body generally is surrounded by a warmer atmosphere, not unfrequently suffer from serious affections of the

tympanum. The Catholic clergy engaged in the confessional box, with the ear turned to the opening where the penitent speaks, and the cold air enters, have often to complain of aural affections, to which this mode of exposure gives rise.

From exposure of this kind I lately saw one case, in a young gentlemen of 29, healthy and strong, where the lower part of the membrana tympani was perforated by ulceration, and otorrhœa, along with great deafness, prevailed ; this especial cause of ulceration of the membrana tympani seems to be well worthy of notice.

Rapid Loss of the Membrana Tympani. Deafness.

October 18, 1854.—W. W., æt. 31, a healthy, fair complexioned man, suffered very much from pain in the right ear, about a fortnight ago. Ten or twelve hours after the pain was felt a discharge from the ear commenced, and in blowing the nose a thin watery fluid was sent through the ear to the exterior, accompanied by a “whizzing noise.”

The remains of the membrana tympani on the

right side cannot be observed, a florid fleshy looking mass, appearing as if it sprouted from the tympanum, occupying the bottom of the meatus. The left ear is in normal condition.

October 22.—A profuse purulent discharge, of pale colour, oozes from the suppurating tympanic cavity, and fills the external meatus ; this is frequently cleared away, and a solution of nitrate of silver dropped into the ear.

The mucous membrane of the pharynx is in an unhealthy state—red and tumid ; to this surface also the solution of nitrate of silver is applied, while quinine and dilute sulphuric acid are employed as internal remedies.

Under the influences of this treatment the otorrhœa gradually subsided, the granulations seen at the bottom of the meatus as gradually diminished, and the lost hearing was in part regained.

The patient never before suffered from any disease of the ear, and the attack in this instance is attributed to the influences of cold air blowing upon the head through a small door in the wall, through which he gives the supplies to the poor, at a public institution, where he has of late been engaged.

This case shews in how short a time the membrana tympani may be destroyed, and how granulations may fill up the lower part of the meatus, and, perhaps, even the cavity of the tympanum, at a time when not more than a fortnight before, it was not known that any aural disease existed.

The deafness on the affected side was extreme ; the tick of a watch pressed closely upon the auricle not being heard.

Ulceration of the Membrana Tympani in cases of Phthisis.

In some cases of perforation of the membrana tympani the aperture in the affected membrane can be at once distinctly seen, more especially if a good speculum and good light be employed ; in others the opening is not so readily discovered, on account of the granulations or discharge at the bottom of the meatus, which may hide the site of the tympanal membrane from view ; here it is often useful to desire the patient to inspire deeply, then to close his mouth and nose, and attempt forcible expiration, for the

purpose of driving the air into the tympanum, and through the membrane, in cases where solution of its continuity has taken place ; this attempt may fail, on account of the closed state of the Eustachian tube, or from obstruction in the tympanum, near to the orifice of this tube ; but it may also be impracticable, or be very imperfectly performed, on account of the extreme weakness of the patient. Illustrations of this difficulty now and then occur in the later stages of cases of phthisis, where suppuration of the tympanum, ulceration of its membrane, otorrhœa, with profuse, and commonly pale muco-purulent discharge, accompanied by deafness, now and then occur ; in such instances the membrana tympani requires to be carefully freed from the discharge in the bottom of the meatus before its real condition can be observed, and it may happen that granulations are in the way of the aperture in the membrane being seen ; while the attempt at forcibly blowing through the tympanum, with the nose and mouth closed, is often found very difficult, and even painful, to patients who suffer from pulmonary, bronchial, or laryngeal disease.

Two cases which serve to illustrate such remarks are at present under my care. In one the patient is

a young girl of sixteen, suffering from cavities in the right lung, and whose life, in all probability, will not be prolonged many weeks.

On visiting her, a few days ago, she said that she had had ear-ache; that she was deaf on the right side; and that on this side there was discharge from the ear. On examination, the deeper part of the meatus is seen to be filled with a pale muco-purulent fluid, through which the air blown into the tympanum bubbles to the exterior, but the strength of the patient is so much reduced that she is scarcely able to make the expiratory effort which is required for this pneumatic mode of inquiry.

In the other case the patient was a man of 36, who had had symptoms of phthisis during the last nine months. One month ago he began to complain of deafness, with discharge from the right ear.

On examination, the appearances met with corresponded precisely to those mentioned in connection with the case last noticed: the aperture in the lower and anterior part of the membrana tympani allowed the air to pass from the Eustachian tube through the tympanum and to the exterior, and the rounded opening in the membrane could be distinctly seen when the

discharge within the meatus was removed. The patient has since died of consumption, but a *post-mortem* examination of the ear could not be obtained.

In patients who have the tubercular diathesis strongly marked—who suffer from pulmonary consumption, and who have, at the same time, laryngeal disease—it is in no way surprising that the Eustachian tube and tympanum should suffer: in such cases morbid action may be set up in the tympanum after the Eustachian tube has previously felt its influence, or the tubercular disorganisation may exist in the aural drum, while the guttural tube remains sound.

Abscess of the tympanum set up in this way may discharge itself by way of the Eustachian tube, which is not common, or by way of an ulcerated opening through the membrana tympani, which is the more frequent occurrence.

In a practical point of view it is of some importance to bear in mind the fact, that in constitutions prone to such disorganisation as the serofulvous diathesis favours, serious disease of the ear, especially of the tympanum, is very apt to occur in connection with the progress of exanthematous affections, or with diseases that disturb the general system, with morbid alterations of the

skin and mucous membrane; while in good, healthy, and strong constitutions, such maladies are less likely to leave behind them any serious traces of aural disease.

In a recent *post-mortem* examination of a case of serious disease of the left ear, extensive caries of the os petrosum was found; in passing the finger along the anterior part of this bone after the brain was removed, it was felt that the dura mater was not supported by any bone at a part a little to the outside of the termination of the carotid canal; the membrane being torn up from the bone, an opening, large enough to admit the end of the little finger was found in it, over which the dura mater was stretched, without itself betraying any marked signs of morbid alteration, on its serous, internal, or cerebral surface, but on the outer side, or that formerly in contact with the bone, a brownish appearance and a somewhat softened surface, from the progress of morbid action, were observed. All those parts of the bone connected with the mechanism of the organ of hearing were involved in the necrosis by which the osseous structure was destroyed, one rounded piece of which, of the size of a large horse-bean, was found completely detached and loose. This loose, and black piece of bone,

from the neighbourhood of the superior semicircular canal, could be felt to be loose, when the probe, during life, was passed down to the bony part of the meatus, but was evidently much too large to be extracted by way of the concha.

The ear itself, as well as the integument of the aural region, was of a deep red colour during life, and through an ulcerated opening behind the concha the probe could be passed into the black and foetid mass of the necrosed temporal bone.

The patient in this case was a little girl, four years old, who enjoyed good health until the age of two years, at two years old she had an attack of "chicken pox," immediately after which otorrhœa on the right side occurred, continued one month, and then stopped, but was immediately followed by the left side otorrhœa, which continued during two years—in other words, during the remainder of life.

Death occurred on the 14th January, 1855, after attacks of convulsion which continued during fifty hours; for the first forty hours the attack was repeated about every ten minutes; during the other ten hours, the child, to use the mother's expression, "passed from one convulsion into another," without any interval

the duration of which was worthy of notice or easily measurable.

After death very great cerebral congestion was met with ; the veins of the brain being full and rounded, with black blood, looking somewhat like thick worms, curling between the cerebral convolutions.

This patient died in Liverpool, but the attack of “chicken-pox” occurred in Glasgow, along with the associations of poverty, bad air, bad diet, and want of ordinary care—to say nothing of the characteristics of the scrofulous constitution, which were somewhat strongly marked.

The preceding remarks respecting the morbid change in the left temporal bone are more than sufficient to shew that the membrana tympani, as well as the contents and walls of the tympanum, were altogether destroyed, and upon the whole the case affords a striking illustration of the serious consequences which may ensue in such instances of aural disease, from that which has been apparently a very small beginning.

The occurrence of death from cerebral congestion and convulsions, without any softening or abscess of the brain, and without any serous effusion within the anachroid, is of importance in a practical point of view.

Scarlatina. Loss of Membrana Tympani. Deafness.

February 21, 1853.—Miss F., æt. 20, had scarlet fever at the age of seven. The attack was severe; the throat affection was bad; the lower limbs were paralysed, and “the memory and speech were affected;” deafness has ever since prevailed, with otorrhœa, on both sides; the external ear is in normal condition; the meatus is large; and the membrana tympani and malleus lost on both sides.

November 9th, 1853.—The otorrhœa is much less troublesome than before; it does not amount to more than a moistened state of the external meatus, and the hearing has improved considerably; these favourable changes have followed the employment of a weak solution of nitrate of silver dropped to the bottom of the meatus, thrice daily, the passage being previously cleared with luke-warm water, gently thrown in by the syringe; tonics, during the same time, being administered.

The hearing of the patient varies considerably; one day she hears conversation “quite comfortably,” while on the next a painful effort of listening may be

required. Such alterations seem now and then to occur, independently of atmospheric changes, and it is not easy to form a satisfactory idea of their proximate cause.

Bands of adhesion may exist in the tympanum, connected, perhaps, with the remains of the ossicula, as well as with the walls of the tympanic cavity. The condition of such bands might, from time to time, be modified by the state of the secretion which moistens, bathes, or loads them; the actions of the ossicula, their ligaments, and muscles, might thus be variously affected; and in the same way the tympanic extremity of the Eustachian tube may be sometimes more, sometimes less obstructed; and it is not improbable that especial disturbances of the stapes, from clogging with discharge of the parts about the fenestra ovalis, may be fairly regarded as sources of occasional alterations of hearing, in cases of this kind.

Children suffering from scarlatina require to be very carefully watched during their convalescence, as well as in the earlier stages of the disease, and this even with a view to aural affections. In a case which came lately under my notice, a little boy, twelve years of age, had completely recovered, as it was thought, from

scarlatina, and after remaining in the house for a week as a convalescent or recovered patient, went out for a walk, on a somewhat damp day; a very severe throat and aural affection followed, and inflammation of the pharynx, Eustachian tube, and tympanum, required very active treatment—for the employment of which the patient, previously weakened by disease, was not in very good condition; he nevertheless recovered, without any serious damage to the ear or neighbouring parts. It is true that severe inflammation of the throat might follow exposure to cold and damp without the previous occurrence of scarlatina, but in the case of this little boy, the ash-coloured and peculiar character of the sloughs within the fauces were sufficiently characterised as associated with scarlatina.

Scarlatina; Inflammation of the Tympanum; Loss of the Membrana Tympani, and of Hearing and Speech.

June 13, 1854.—E. S., a little girl, æt. 6 years, had good hearing until the age of $4\frac{1}{2}$ years, when she suffered from an attack of scarlet fever, which seems to have been very severe—extreme indisposition prevailing during more than a quarter of a year; the head suffered considerably, and delirium more than once occurred.

About one month after the attack of scarlet fever, otorrhœa, on both sides, was observed, and the discharge has ever since continued. The attack of fever commenced on the 21st of January, 1853, and in the month of April, or about a quarter of a year after, the deafness was particularly noticed by the mother of the patient, and even at this time it was found that she could not hear the loudest shouting.

As yet, however, the faculty of speech, which had been very good from early infancy, had not become impaired; but in three months more, or in about six months after the first attack of scarlet fever, “she began to talk in a mumbling manner,” and during

the five or six months next following she gradually lost her speech, so that she has lately, or during about half-a-year, been regarded as deaf and dumb; nevertheless, she has retained a very small number of words, connected mainly with the gratification of bodily wants, and such words have never been completely lost; the two or three by which she appears more especially to hold fast are in the significant phrase "treacle-and-bread," of which she seems to have been always fond.

It is not improbable that lesion of the acoustic nerve took place near to the time when the delirium prevailed, and hence there is good reason to think that the deaf-mutism will be permanent.

The membrane of the tympanum is lost on both sides; in the left ear a portion of its exterior or rim is visible; on the right side red granulations are seen, at the part where the membrane was formerly attached.

The extent of injury inflicted on the deeper parts cannot, of course, be adequately determined, but the extreme deafness suggests the idea that the labyrinth has not escaped the influences of morbid action.

Glycerine was dropped into the ear, and small portions of cotton, soaked in glycerine, were placed

as nearly as possible in the situation of the tympanal membrane, but the effect produced could not be regarded as in any way remarkable.

The taste, and muscular power of the tongue appear to be good, so that there is no reason for thinking that the cerebral nerves supplying this organ have in any way suffered.

Education suited to the deaf and dumb was recommended.

In cases of this kind, where the injury inflicted upon the organ of hearing is often far from being confined to the tympanum, or its outer closing membrane, it is commonly found that the employment of an artificial membrana tympani is not of any use ; and that this should be so, it would not seem difficult to understand, for, if the chain of tympanal bones be lost (and this, probably, with destruction of the membrane of the fenestra ovalis, and with changes in the labyrinth likely to be associated with such alterations), it is obvious that the physical conditions for the transmission of sonorous vibrations, and the vital conditions for the perception of sound, are alike unfavourable to the occurrence or the enjoyment of audition.

It is well known that the throat affection, in scarlet fever, often branches from the pharynx, through the Eustachian tube, into the tympanum, and thence to the exterior, by way of the external meatus (the tympanal membrane giving way), or through the mastoid cells and process, and the soft parts covering these; more rarely the morbid action is directed to the interior of the cranium, in this way threatening life as well as hearing.

In a small number of cases of this kind collections of matter, formed within the drum of the ear, pass thence to the throat by way of the Eustachian tube; but in a far greater number of instances this very narrow tube is closed from swelling of its walls by the time that abscess has formed within the tympanum; thus the purulent collection is pent up within this bony cavity, where the membrana tympani is the most yielding part, and hence, in most cases, the first to give way. This structure is perforated by ulceration; matter oozes from the external meatus, and the patient is for the time relieved of pain. Unfortunately, however, it but too often happens that, by the time relief is obtained in this way, the delicate structures of the middle and internal ear have sustained irreparable injury; so that

it is of the utmost importance to the hearing, if not to the life of the patient, that the earlier symptoms of the aural or tympanal affection should be adequately attended to, the state of the membrana tympani observed, and its puncture practised, to give exit to the accumulated matter which bulges it outwards, in all cases where such an operation is practicable, and not especially contra-indicated ; in this way hearing might perhaps be often, and life occasionally, saved,—for, timely exit being given to the purulent collection, its alteration or decomposition within the temporal bone would be prevented, the ossicula and labyrinth would be less endangered, and the brain more likely to escape unhurt, either from inflammation of its membranes, or caries of the temporal bone, or from both—to say nothing of alterations in the blood-vessels, or of plastic exudations, fibrinous clots, pus, or sanies, in the arteries, sinuses, or veins, or of haemorrhage from the opening of blood-vessels by ulceration—an occurrence which now and then takes place after scarlatina. In this way the carotid trunks, or some of their higher branches, may suffer, as well as different parts of the venous system of the head and neck.

In one case that came under my notice, where the

throat affection in scarlatina had been very severe, extensive sloughing of the soft parts on the right side of the neck took place, so as to expose the carotid artery ; in this case gradual sinking went on, until a fatal termination occurred, without any serious haemorrhage, although the carotid sheath was for some days concealed only by the feeble granulations which covered it.

“ In a case of scarlatina, under the care of Dr. Little, the ulceration and caries of the ear proceeded so far as to involve the lateral sinus, which gave way, and the patient sank from the haemorrhage.”

Encephalic haemorrhage may account for some of the unexpected, and fatal terminations, of cases of scarlatina, about which more or less obscurity now and then hangs.

Scarlatina. Inflammation of the Tympanum. Loss of the Membrana Tympani, and of Hearing and Speech. Discharge of the Ossicula, and of Sequestra of the Temporal Bone. Treatment. Gradual Improvement of Hearing. Speech regained.

October 29, 1853.—E. P., a little girl, æt. 7 years, had no aural or other complaint until the summer of 1852, when she suffered from scarlet fever, with severe, throat, and aural, affection, which left her completely deaf; and since this time the faculty of speech has been gradually lost.

Behind the right ear, and in the integument covering the mastoid process, a large scar is seen, where abscess formerly existed.

There is otorrhœa on both sides, but more profuse on the left, where the deeper part of the meatus is much narrowed.

The parts within the cavity of the tympanum would seem to have been much disorganised, ossicula having come away from both ears during a process of poulticing, which was kept up for three months after the scarlet-fever passed off; small portions of carious bone

were also discharged, whether from the meatus, or from the abscess behind the ear, cannot be very well determined; but probably they came from the abscess behind the right ear, the vestige of which is seen in the cicatrix above noticed.

November 14.—The otorrhœa is already diminished, by irritation kept up on the integument covering the mastoid process, first with croton oil, afterwards with unguentum lyttæ.

November 17.—Very damp weather just now prevails; and within the last two days a little more of the otorrhœa has appeared, for which a solution of sulphate of copper is prescribed, to be dropped into the ears three times a day.

November 19.—The aural discharge has diminished on both sides; her nurse states that this morning she is pleased with, and smiles at, the ringing of bells in the house. The right aural meatus is larger than the left; but both are now less obstructed than before, and at their deeper part apparently of greater dimensions.

February 8, 1854.—Up to this date the hearing has gradually improved; and her nurse states that she has now regained something of what she had previously lost in speech.

The patient now hears when loudly spoken to, and repeats, when requested, certain words, such as “Elizabeth,” and other names of children around her, which she appeared unable to utter a few weeks ago.

The drops with sulphate of copper are yet continued, the ears kept very clean, and a little irritation, from the rubbing of nitrate of silver over the mastoid process, is kept up.

The general health is very good.

June 1, 1854.—Hears smart and loud sounds ; her speech seems to be quite regained.

June 8.—The hearing appears to have gradually improved of late ; the striking of the clock has now become audible to the patient ; and she now “speaks very well indeed,” and is entirely free from otorrhœa.

In this case the amount of improvement reported by the nurse could scarcely have been credited, without actual observation.

It would be difficult to imagine a case of greater interest than this. The loss of hearing seems to have occurred as soon as the aural mechanism was damaged by the morbid processes above noticed ; but the loss of speech appears to have followed as a slow and gradual result.

In such cases, if art do not interfere, the injury to the organ of hearing may gradually increase during a considerable time ; and from the advancing changes in the delicate structures affected, the deafness, which at one time was complete, may, by and bye, become not only complete, but irreparable ; and if at the same time the speech should have been completely lost, the ear could no more be brought to bear upon its second acquisition ; so that it is of the utmost importance to do all that can be done in these cases at the earliest possible period, otherwise the patient may for ever lose both hearing and speech, which he once possessed, and which, perhaps, at one time he might have regained.

It occurs to me here to remark that children born deaf often make apparent and remarkable efforts at speaking ; attempting imitation in the actions of the lips, now and then with great vigour, as if quite impatient to speak ; while those who have become deaf and dumb after previously enjoying both hearing and speech rarely exhibit the same manifestation.

Nature, if so we may express it, is evidently willing to do much in cases such as is here related, more especially if art assist a little, and hindrances

to improvement are kept out of the way. Allusion is here made more especially to the remarkable adaptation of new conditions of the aural mechanism to the important function of hearing ; for, in this case, we see the deeper part of the meatus altered, the membra tympani destroyed, the chains of ossicula broken up, and bones on both sides discharged, with sequestra from a diseased temporal bone ; and hence, for a while, hearing completely lost ; nevertheless, after an interval of a few months, the ear is sufficiently repaired to allow its function again to commence.

Bones, or portions of bones, discharged from the ear, in cases of this kind, should be very carefully observed. The malleus, or incus, may be found unbroken, but the incus, as is easily understood, from its size, and form, is more frequently seen in the entire state ; the stapes, fortunately, often remains *in situ*, when the other ossicula have come away ; in connection with such observations, the os orbiculare does not require especial notice.

When the ossicula auditus are discharged from the meatus, they may now and then be found upon the poultice or other external application employed, more especially if the patient have rested his head on the

affected side, so as to favour their falling from the auditory canals ; they are commonly white, and clean-looking—a fact worthy of being borne in mind, for, in cases of caries of the temporal bone, where the osseous structure is more or less broken up by diseased action, dirty-looking bits of bone are sometimes discharged from the external meatus, which should, and may, generally, without difficulty, be distinguished from the auditory ossicula themselves, these being commonly so different in colour.

It frequently happens that the practitioner must depend on the account of the patient, or his friends, for information respecting osseous pieces that have been discharged from the ear ; these, if preserved, can, of course, be easily examined ; but, if lost, their form and aspect are often forgotten, unless in some unfavourable cases, in which the stapes has come away, the peculiar shape of which may attract the attention even of a very ordinary observer, if from its small size it should not escape notice altogether.

In the case just related, the other organs of sense did not sustain any injury.

Otorrhœa. Perforation of the Membrana Tympani.

October 14, 1853.—M. G., a female, æt. 51, has been deaf during the last forty years. The hearing distance for the tick of a watch is two inches on the right side, and one on the left.

The left auricle has its normal aspect, and the meatus is of good size, but at the bottom of it a light red and florid surface of granulation is seen upon the membrana tympani, while of the natural appearance of this membrane nothing is observed ; otorrhœa, with very foetid discharge, has prevailed on this side during the whole period of her deafness ; the discharge “now and then stops for a week together,” when she becomes much more deaf than before ; but, if the nose be at these times violently blown, the otorrhœa is suddenly reproduced, as if some hardened and concrete matter had prevented the exit of the fluid resting near the membrane of the drum.

There has been but little otorrhœa on the right side, although this ear has run a little occasionally ; on this side the membrana tympani is opaque, but not perforated.

The membrana tympani on the left side is partly, if not wholly, destroyed, but the red granulations at the bottom of the meatus prevent any satisfactory view being obtained. Air blown from the Eustachian tube enters the external meatus mainly at a part corresponding to the lower portion of the membrana tympani, so that the primary perforation of this membrane has probably been in this situation.

After washing the meatus, a weak solution of nitrate of silver was dropped into it, and the patient directed to have this practice continued.

In this case, although so serious a change in the organ of hearing had long existed, the patient had passed over her forty years' deafness without any effort towards ameliorating her condition.

January 2, 1854.—The instillation of the drops of nitrate of silver was continued during six weeks, and with decided benefit to the ear; the otorrhœa was subdued, the volume of the granulations considerably reduced, and the fœtor along with the discharge got rid of—so that some weeks have elapsed during which the patient has considered herself much improved, although she suffers from re-appearance of the aural discharge when she happens at any time to

have a severe cold. The hearing is now better on the left than on the right side.

It is worthy of notice, that in some patients who suffer from perforation of the membrana tympani on one side, and not on the other, the deafness is greatest on the side where the tympanal membrane is entire,—shewing, that lesions, but little seen, now and then tell more upon audition than important alterations which can be subjected to ocular inspection,—in other words, that we may have on one side opacity of the membrana tympani, with no other visible alteration, associated with a great amount of deafness, while on the opposite side we have loss of the whole, or of a part, of the membrana tympani, with less injury to audition; this difference in the amount of hearing depends, in many cases, upon the different conditions of the Eustachian tube of the two sides.

**Deafness. Loss of the Membrana Tympani on
both sides.**

August 4, 1855.—A. J., a girl of 19, lost the membrana tympani on both sides, from an attack of scarlet-fever, when four years of age.

On the left side, the bony part of the external meatus is filled with what may be called a bunch of cauliflower-like granulations, at the lower and back part of which is an aperture, through which the air is easily blown from the throat, so that on this side the Eustachian tube may be regarded as pervious.

On the left side, the Eustachian tube appears to be closed, the passage of air from the throat towards the tympanum cannot be heard with the otoscope. On this side, pale red granulations are seen in the depth of the meatus, but they do not project into it so as to shorten its canal, as on the opposite side.

This young woman is in feeble health, pale and thin, working ten hours of the day in a Stockport factory. She has now been deaf about fifteen years, and the aural disease has not hitherto received any attention; but although left so completely to itself, it

does not seem to have increased in any very remarkable manner,—in other words, the patient is not more deaf now than she was ten years ago.

In connection with the left ear we have obstruction of the Eustachian tube, while the external meatus is free and open as far as the usual site of the membrana tympani ; on the opposite side the Eustachian tube is free, but the deeper part of the external meatus is filled by the fleshy growth above noticed ; and, along with these opposite states, it is worthy of remark, that, on the side where the Eustachian tube is obstructed, the deafness is extreme, while on the opposite side, where the external meatus is obstructed, the deafness is much less.

The removal of the fleshy granulations from the deeper part of the meatus, which is filled by them on one side, and the catheterism, and injection of the Eustachian tube on the other side, with the view of restoring its patent condition, are therapeutic proceedings clearly indicated. The improvement of the general health by chalybeate tonics, and by out-door exercise and pure air, are not less desirable. These and other suitable means conjoined, would, doubtless, aid the acquisition of a greater degree of hearing.

The remedial agents above noticed were recommended, and although the case has only just been seen, and the results of treatment have yet to be waited for, the pathological conditions enumerated were thought to possess some interest in themselves apart from the probable effects of remedies.

The route by which the air blown from the Eustachian tube reached the exterior of the left ear was especially worthy of remark, as it passed through at the lower and back part, behind the bunch of granulations, while we far more frequently find it coming through an aperture at the lower and anterior part—the point where the aperture of the membrana tympani is most commonly found—in cases where the opening is so small that the greater part of the membrane has been spared. It may, however, be observed that nothing of the membrana tympani could be seen, even if any of it exist; so that this membrane may originally have given way in the usual situation, just opposite the Eustachian tube, and the air so easily blown through the ear may course circuitously, from the outer and anterior part of the tympanum to the outer and posterior part of the external meatus.

It commonly happens that we see cases of per-

foration of the membrana tympani when such perforation has already existed some time, and when also a considerable portion of the membrane may be lost, so that there is but very rarely any chance of re-union of the divided structure, either with or without the interference of art; this is more especially the case when the diseased actions which have preceded the ulceration of the membrana tympani have not been such as belong to common inflammation, but have been associated with cachectic conditions of the system, or with the progress of specific diseases, to say nothing of the common neglect of the aural affection in its early stages, or at a time when remedies might have been most advantageously employed.

In cases where perforation of the membrana tympani occurs along with scrofula, syphilis, scarlet-fever, measles, typhus, or long continued catarrhal affections, the re-union of the perforated membrane is exceedingly rare; while, in cases of abscess of the tympanum following inflammation not of a specific character, and not associated with cachectic conditions of the system, or with maladies that have affected much either the health in general, or the tegumentary or mucous membranes in particular, the matter may be discharged

through an opening in the membrana tympani artificially made, or spontaneously occurring, and with much greater chance of re-union in the divided structure. These, it may also be observed, are the cases in which art may interfere with the best prospect of benefit, for the inflammatory affection is commonly active, and progresses with more or less rapidity to the formation of matter, which distends the tympanum, and bulges out its outer membrane; while, in cases of the other class, the constitution is often weakened, the morbid processes feeble, and their results but slowly developed, so that before the distended tympanum is relieved by the ulceration or bursting of its outer membrane, a great amount of mischief has been done to the Eustachian tube, the tympanum and its contents, or even to the structures of the labyrinth; the patient in such cases being often regarded as fortunate if he escape from serious disease of the cranium, the nervous centres, or their investing membranes.

It is not to be supposed that in all cases of the latter class it would be useless to watch the progress of the affection of the tympanum, or the manner in which it may tell on the membrana tympani; for instances now and then occur in which this may be

done, and where the timely interference of art may be of the utmost importance, for, when the evidence of abscess of the tympanum is satisfactory, and the time for opening or bursting of the membrane has arrived, a small puncture made into the pointing part of it with a broad cataract needle may give timely exit to the offending fluid, and thus avert a great deal of mischief.

Loss of the Membrana Tympani on both sides.

Deafness. Hearing improved by the Artificial Membrana Tympani.

August 4, 1853.—J. M., a strong man, æt. 32, has been deaf during the last twenty years; he received an injury of the head, when twelve years of age, from a squeeze between the back part of two carts, which were “backed up, one against the other,” with the head of the patient caught between them.

Since the time of the accident a constant otorrhœa has prevailed on the right side; otorrhœa on the left side is also complained of, but it is not constant,—

recurring after long intervals of two or three months, and then continuing for two or three days only.

The constant otorrhœa on the right side, and its occasional appearance on the left, are in some measure explained by the anatomical conditions which the deeper part of the meatus presents.

In the depth of the right meatus a considerable sprouting of red granulations is seen, which occupy a part of the canal so as to reduce the length of its open tube, and in this way obstruct the auditory apparatus; these granulations seem to arise in part from the site of the membrana tympani, which is lost, and there is little doubt that granulations exist within the tympanum, as well as in the depth of the meatus; in this way the physical conditions of the auditory organ are materially altered, so that sound cannot have its normal play, while the vital state of the parts destined for the perception of sonorous impressions cannot fail to be unfavourably influenced by the morbid condition of the neighbouring structures.

On the left side, the state of things is somewhat different; here the membrana tympani is also lost, but the additional, subsequent, or resulting alterations, are far less remarkable than on the opposite side; the

deeper part of the meatus is somewhat narrowed by thickening of its lining membrane, which is intensely red, and the part of the tube where the membrana tympani ought to be is narrowed by chronic alteration of the surrounding surface, but is not crammed by granulations like those observed in the other ear..

In the cavities of the nose, mouth, and pharynx, the appearances are normal.

Viewing the state of the ears in connection with the account above given, and apart from anything relating to the Eustachian tube, it is obvious that this is a case for trial of the artificial membrana tympani, that the right meatus, being filled with granulations at the bottom, promises little at present from the employment of the artificial membrane, but that the left ear, less obstructed by morbid growth, is in a more favourable state for attempting the adaptation of the instrument of Mr. Toynbee.

The introduction of the instrument in question answered the expectations just suggested ; passed into the right meatus, it was not found that any improvement in hearing was effected ; but on the left side a decidedly better state of audition was noticed, after placing the instrument in position, and this favourable

alteration was determined to be such by several subsequent trials; the patient on each occasion declaring the hearing to be improved as soon as the aural helper was employed.

It seemed fair to suppose that after the deeper part of the meatus, and the neighbourhood of the membrana tympani, should have been favourably influenced by the use of detergents, with the daily instillation of a solution of nitrate of silver, and thus a better state of surface in the depth of the canal obtained, that the audition would be further improved, and the artificial membrane rendered still more useful, if yet required.

In connection with cases previously described, it has been observed that the conditions of the Eustachian tube and tympanum vary considerably, as far as the perflation of these parts may be concerned, when the membrana tympani is perforated, or entirely removed, by ulceration; the case now under consideration affords an additional illustration of this truth, which is of considerable importance in connection with diagnosis. The patient, without being questioned on the subject, remarks, that at times he can blow "right through" both ears, when he closes his mouth and nostrils, but

that at other times he is not able to do so, and it is found that at present the perflation is not practicable on either side; these different conditions, at different times, are probably dependent on varying states of the tympanum, or deeper part of the external meatus, modified by the quantity, quality, course, or position of the discharges, the greater or less amount of injection of the granulating and vascular surfaces, &c.; while the alterations occurring to the Eustachian tubes are also likely to interfere with the perflation of the auditory apparatus, but more especially at the time when catarrhal affections prevail.

The remarks already made show that the Eustachian tube may be regarded as pervious on both sides, and that the conditions on which deafness depends are, the loss of the membrana tympani on both sides, and the associated anatomical changes in the external meatus and tympanum.

It is easily supposed that in such a case the labyrinth will not be in precisely the same condition on the two sides; in other words, that on the right side, where the apparent changes are much greater than on the left, the deeper alterations which are not apparent, will be in a more or less corresponding

condition, so that the essential part of the ear destined for the perception of sound may be supposed to have its vitality and sensitiveness blunted by some amount of influence of the same morbid action which has damaged the mechanism of the middle ear, and thus spoiled the physical conditions required for the due performance of the functions of the accessory parts of the auditory organ ; this view of matters was found to be correct when the state of the hearing was tested with the aid of the tuning-fork ; for, this instrument being struck into vibration, and its handle placed in contact with the head, first near to one ear, and then equally near to the other, it was found that the sonorous impressions conducted through the bones of the skull were much more strongly perceived on the left side than they were on the right.

**Loss of the Membrana Tympani on both sides.
Deafness. Hearing improved.**

Mr. A., a strong man, æt. 30, is the mate of a large ship, and, of course, much exposed to vicissitudes of weather. He has been deaf during the last two years, and attributes his deafness to "cold." The left ear is more deaf than the right.

The membrana tympani is lost on both sides, but the air is not blown through the tympanum on either side, nor can it be heard to enter this cavity when the otoscope is employed; nevertheless, it has been found by the patient while using drops with nitrate of silver, that, on the right side, the solution "passes from the ear into both the nose and mouth."

This additional proof of the perforation or loss of the tympanal membrane has some value, inasmuch as the fact cannot always be determined by the eye or ear of the surgeon, although employing the speculum or otoscope, so that it is commonly a good practice to enquire of the patient whether or no the drops passed into the ear seem to enter the pharynx, nose, and mouth; and as nitrate of silver is so frequently

employed, and its taste so disagreeable, and easily recognised, we have now and then in this substance an instrument of diagnosis, as well as a therapeutic agent.

In this case there was no red granulation visible in either meatus; the parts about the site of the membrana tympani were clogged with mucus, which was directed to be frequently washed out with a weak decoction of oak bark, and the solution of nitrate of silver to be dropped in, half an hour afterwards; the caustic was also rubbed largely upon the integuments covering the mastoid process, and it was quite evident that after this treatment had been continued during a fortnight the hearing had decidedly improved.

It might be remarked that there is, at first sight, something strange in the fact that air cannot be blown into the tympanum from within, outwards, when it is found that a solution of nitrate of silver will pass through the ear to the throat from without, inwards; but it has been before remarked that the state of parts varies considerably at different times in cases of this kind, perflation of the tympanum being often practicable one day, when, on the next, the patient, perhaps, cannot, with the greatest effort, blow through

it ; besides which, it might so happen that a slightly valvular fold of mucous membrane would admit fluid passing inwards, but resist air rushing in the outward direction.

In connection with the employment of the artificial membrana tympani it may be observed that there are sources of mistake, against which the surgeon must guard.

At the time of the first application, the excitement, or hope, of the patient, from the use of a remedy in which he may, perhaps, have been previously induced to confide, may lead to the expression that the hearing is improved, but which subsequent observation will not always confirm.

It also now and then occurs that the patient at first states that he hears much better with the aid of artificial closure of the tympanum — in other words, when the artificial membrana tympani is introduced ; but it may nevertheless be discovered on some subsequent day that the improvement is not such as was at first supposed, inasmuch as the patient may remark that he hears “ more noise ” than he did before, but that he cannot distinguish sounds any better. This observation has been recently made to me by a gentle-

man who seemed at first to be much benefited by the artificial membrana tympani.

Constitutional treatment, and local applications, to the meatus, tympanum, and Eustachian tube, will be found useful, or even absolutely necessary, in many cases of perforation, or destruction of the membrana tympani, before the artificial membrane can be applied with any prospect of being of much service; for the cases best suited for its use are those in which the membrane presents merely a perforation to our view, without any other morbid alteration in the depth of the meatus, or in the tympanum; so that, in cases where thickened, vascular, or granulating surfaces exist on either side of the site of the membrana tympani; when the meatus, or Eustachian tube, is narrowed, closed, or obstructed; or where other morbid complication exists, we should seek to remedy such abnormal states, and to reduce the case as nearly as possible to one of perforated tympanal membrane, before the instrument in question is attempted to be regularly worn.

It is also worthy of remark that during the treatment alluded to, which at first may be undertaken as preparatory to the application of the artificial

membrana tympani, it now and then happens that considerable improvement in hearing takes place, so that it may ultimately be found that the contemplated instrument is not required; or that, if applied, the additional improvement in hearing which it is capable of producing is not great enough to secure its regular or continued employment on the part of the patient.

It is easily understood that diseased states of the mucous membrane lining a cavity so small as the tympanum, and containing parts so exquisitely organised, cannot fail, in their various and changing conditions, to be associated with considerable modification of the function of hearing; and inasmuch as certain applications, such as the acetate of zinc, the sulphate of copper, or the nitrate of silver, have considerable remedial influence in cases of chronic inflammation of the guttural and aural mucous membrane, it is evident that they should be at once used in all cases where they are indicated, either alone, or in combination with such other local and general remedies as special cases require; indeed, it might be said that nearly every case in which the membrana tympani is perforated, or destroyed, had better be regarded as a case of disease of the mucous membrane of the tympanum, and treated

accordingly; for, in most cases, the injury of the membrana tympani has taken place from within, outwards, disease having existed within the tympanum before this cavity was made to communicate with the external meatus by the breaking of their membranous septum; while, in the very small number of cases in which the perforation of the membrana tympani may have taken place in the other direction, the progress of disease from without, inwards, associated with the inlet of air to the tympanic cavity, will not often fail to set up a morbid condition of the mucous lining of the drum, which will certainly call for the aid of detergent, antiphlogistic, counter-irritant, astringent, styptic, or soothing remedies, and in some instances nearly all these may be required.

SECTION II.

Diseases of the Auricular Region, Auricle, and External Meatus.

IN the cases previously related, the cavity of the external meatus and that of the tympanum being virtually made into one chamber by the perforation of the membrane which in the normal state establishes their separation, it is easily understood that any morbid condition of which one part partakes, is likely to be shared by the other, so that we often find that the lining surfaces in the diseased state are very much alike, while in the healthy condition there is considerable difference between the lining of the external meatus and the mucous membrane of the tympanum.

Such morbid condition being common to the outer and deeper parts of the organ, remedial agents applied within the external meatus, from whence they may run to the tympanum, will frequently be found serviceable to both these divisions of the diseased ear, and, in

some instances, if employed in sufficient quantity, their good effects may tell upon the Eustachian tube, provided the communication between this passage and the cavity of the drum continues to be free.

It is of the utmost importance in the examination of any case of disease of the ear with a view to diagnosis and treatment, to determine, if possible, whether any communication exists between the tympanum and external meatus, by virtue of congenital absence, perforation, ulceration, or destruction of the membrana tympani; for, if such communication do exist, the ear must always be regarded as an abnormal or diseased organ, requiring, frequently, for its treatment, and constantly, for its preservation, remedies, and hygienic attentions which have been previously alluded to, and which are not so imperatively necessary in other states of the auditory apparatus.

The cases which next follow relate more especially to diseases affecting the ear in parts of this organ external to the membrana tympani; at least this is to be regarded as the region of the principal or leading part of the disease; but it very frequently happens, even in this class of cases, where the membrana tympani is entire, that we have, nevertheless, morbid

changes going on in the guttural and tympanic, as well as in the external divisions of the organ of hearing, at the same time, so that one of the practical cautions which is required here is, not only to find out that there is a certain form of disease within the external meatus, which is capable of being submitted to ocular inspection, but also to make out, by the aid of the otoscope, Eustachian catheter, watch, tuning-fork, or other means of physical and rational diagnosis, whether any morbid condition of the parts more deeply seated be associated with the more external disease, and to determine the pathological relations, and the relative importance of the co-existent forms of aural malady.

Thus the practitioner will not treat "deafness" in the old-fashioned, or empirical way, but will rationally manage diseases of the ear—being possessed of a knowledge of their sources, combinations, nature, and tendencies; for, although deafness might be regarded as one, its causes are many and various; so that for its removal we are constantly required to avail ourselves of constitutional and local remedies, suited to the special indications of particular cases, and the selection of these therapeutic agents must be regarded as mainly

dependent on the results of a pains-taking and well-established diagnosis.

In addition to the constitutional treatment frequently required for such forms of aural disease as are next to be noticed, the local remedies used are of the utmost importance, and hence must always claim a great share of the attention of the practitioner ; these, although numerous, may be regarded as chiefly of two kinds ; first, the agents employed for the removal of offending matters from the meatus ; and, second, the local remedies for inflammation and its various consequences, affecting the external ear and meatus.

Occasional Deafness.

Abnormal Direction of the External Meatus. Deformity of Extremities.

November 11, 1854.—C. S., æt. 10, is “dull of hearing, and now and then much more deaf than usual.” The head is of peculiar form ; the forehead large, and overhanging the face ; the hinder part of the head rising straight up from the neck. The aperture of the meatus externus is very high, being

on a level with the lower part of the ossa nasi. The course of the meatus runs from without, backwards, and also remarkably downwards, so that the descent of anything capable of moving along this canal towards the membrana tympani is very much favoured : the membrana tympani is opaque on both sides.

The hands and feet are deformed ; the toes all united into one broad piece, expanded anteriorly into a shape not unlike that of a fish's tail, with five nails, of square form, placed with their edges side by side and in close juxta-position. The phalangeal portion of each foot may be said to consist of three parts—the great toe division and the little toe division being sufficiently distinct from the middle division, in which the phalanges seem to form one mass by soldering or very close juxta-position of the bones.

The phalanges of the right hand are gathered into one conical lump, on the ungual extremity of which are three nails, a middle nail arched over what seems to correspond to three fingers ; hence this ungual piece is very broad ; the two lateral nails, corresponding to the thumb and little finger, are much less, the latter being much the least of the three. The left hand is found to be in corresponding condition.

The interior of the mouth presents a very curious formation ; the palatine arch being very narrow ; the soft parts at its sides so full and bagging, that they are pushed nearly into *juxta-position* with one another in the middle line.

The intelligence is feeble, and the expression of the countenance has a corresponding appearance. The father of the patient is a healthy man, but his mother was epileptic before his birth, and yet continues to suffer in the same way.

The direction of the external auditory meatus would favour the plugging up of this canal by cerumen or any other accumulation occurring within it, so that this consideration may help us to account for occasional deafness, even if no other cause were in operation ; add to this, however, the opaque state of the membrana tympani, and the habitual dullness of hearing is further accounted for. Viewed as a whole, the case is highly interesting — presenting a cluster of abnormal developments in the extreme, or peripheric parts of the body, while the more central parts, as far as can be ascertained, would seem to be fashioned in the usual way.

In the ear of normal formation, the direction of

the meatus externus is such that the delicate structure of the membrana tympani is guarded as much as possible from the influences of the external air; but in the case just related the course of this canal is reversed—so that the membrana tympani may be said, in some measure, to meet the air, and is hence more likely to suffer from its action; this consideration may help to account for opacity of the tympanal membranes.

Deafness.

Inflammation of Meatus Externus.

November 12, 1853.—J. S., at. 24, became deaf on the 9th of July last, and the deafness has since gradually increased, and is now such as to produce great and constant inconvenience. The general health is good, and the tympanum is inflated through the Eustachian tube on both sides.

The cause of the deafness is seen to be at the bottom of the meatus on each side, where thickening and redness of the lining membrane are observed,

along with accumulation of cerumen covering and closely coating the membrana tympani.

The above observation was made after the ceruminous accumulation had been removed, and the parts allowed a sufficient interval of rest to permit them to regain their true aspect after the disturbance produced by the injection of warm water had passed away.

Mr. S. bathed frequently in the sea in June and July, 1853, often diving completely under the water, a practice which he "enjoyed very much," generally taking care to hold his breath; for whenever he took his breath while under the water, the fluid, he says, rushed into the external ear, and in some way produced an extreme amount of deafness, which did not leave him for a week after; the patient attributes his present deafness to this practice of bathing.

A leech was applied in front of each ear; two days later a blister over the mastoid process on both sides: at first aperients, afterwards the iodide of potassium, and sarsaparilla, were administered. These means sufficed for improving the condition of the meatus and restoring the faculty of audition.

It is not impossible that the injury sustained when bathing arose from the entrance of salt water to the cavity of the tympanum, by way of the Eustachian tube, and that the feeling of fluid rushing to the external ear was but a deception, partly, perhaps, depending upon the exercise of sensation within a medium unfavourable to accurate perception.

Relaxed state of the Lining Membrane of the Meatus.

October 14, 1853.—W. C., æt. 82, has been “hard of hearing” for some years. In addition to a possible defect of the acoustic nerves, associated with very advanced age, there is a mechanical condition of the meatus, capable of altering the hearing in some degree, and which is not unworthy of notice; it consists in a relaxed state of the lining membrane at the commencement of this canal, which lessens by about one-half the calibre of the auditory conduit.

A portion of tube, of about half-an-inch in length, cut out of a large quill, being passed into the meatus, so as to keep its external part patent, the hearing is found to be improved.

Extreme Deafness.**Morbid condition of the External Meatus.**

October 1, 1853.—Miss L., æt. 42, had an attack of inflammatory disease in the chest nine years ago, from taking cold, as she believes; the patient says that the deafness followed this affection, but it seems probable that both pectoral complaint and deafness were preceded and caused by frequent exposure to cold in a shop in which she stood, and to such exposure, rather than to anything else, the aural affection seems traceable; the deafness is not extreme, but great enough to cause considerable inconvenience.

In the right ear the lining membrane of the meatus is considerably thickened within the bony part of the canal, with a rough and irregular surface; in the left ear, also, there is marked narrowing of the deeper part of the meatus, so that no satisfactory view of the membrana tympani can be obtained in either organ; but from the state of the canal where it is closed by the membrane of the drum, it may be inferred that the actions of this delicate apparatus will be inevitably modified, or hindered, by the anatomical change which has taken place in its vicinity, to say nothing of its own condition.

The nasal cavities and their boundaries appear to be healthy, and the catheter enters the guttural extremity of the Eustachian tube on both sides. In the mouth and pharynx there are no morbid appearances, saving what are associated with lost and bad teeth.

In some cases more or less of this kind, where the deafness is greater on one side than on the other, it may, and does not unfrequently happen, that the better ear is rendered worse by some accidental cause, such as accumulation of cerumen in the external meatus, obstruction of the Eustachian tube, or mucous collections in the tympanum, when the patient is of necessity alarmed by the extreme deafness, or total loss of hearing, which thus occurs ; the cause of which, however, may be determined by inspection of the external parts with the speculum ; by catheterism of the auro-guttural tube ; by injection, or inflation of the tympanum ; after which an encouraging prognosis may often be given ; in this case the right ear, with which the patient hears much better than with the other, had become stopped by cerumen, and the extreme deafness thus caused was easily relieved by the removal of the ceruminous plug.

October 8.—The left auricle is found red, thickened, stiff, dry, hot, and tender, for which two leeches are applied in front of the meatus.

October 10.—The above-mentioned state of the auricle is now found to be associated with the occurrence of a small boil at the commencement of the external meatus.

October 15.—After poulticing and fomentation, the boil has now broken, and a white core is ready to escape from its centre; the suffering connected with the formation of this boil has been very great; the pain, however, which was much alleviated by repeated leeching, has at length subsided.

In cases of this kind, if any purulent collection take place in the deeper part of the meatus while the external orifice is closed by swelling, or by agglutinated concrete discharge, considerable suffering is sometimes caused; the patient may complain even of feeling the movement of matter within the ear, and at the same time be annoyed by the impossibility of getting it out; so that it is important to adopt means for keeping the aperture of the meatus in a patent condition, by a bit of oiled lint, or other suitable tent.

Narrowing of External Meatus. Enlarged Tonsils.

October 28, 1853.—C. J., æt. 12, a healthy-looking girl, has always heard well until about three months ago, when she became very deaf, after being out in a heavy rain, and keeping her wet clothes on during two hours. The ticking of a watch is not heard on either side, even when pressed closely upon the auricle.

The meatus on both sides is narrowed by thickening of its lining membrane, and filled up with a peculiarly white secretion. The tonsils are considerably enlarged. The ceruminous accumulation being in great measure removed, the ticking of the watch became audible on either side, at the distance of about three inches; nevertheless, the hearing is far from being in normal condition, and its defect evidently requires to be studied, in connection with external, guttural, and tympanic alterations. The deeper part of the meatus is very narrow, so that a good view of the membrana tympani cannot be obtained.

A weak solution of nitrate of silver is dropped into the meatus, and an astringent gargle, and tonic medicines employed; good diet, and warm clothing,

and an occasional sponging of the skin with vinegar and water, followed by brisk rubbing of the surface, being at the same time recommended.

This patient was seen last about a month after the above treatment was commenced, when it was found to have been beneficial to the state of the general health, and to the throat, as well as to the ear and hearing.

Opacity of the Membrana Tympani. Ceruminous Accumulation.

Deafness on both sides. Restoration of Hearing.

September 20, 1853.—T. F., æt. 27, a healthy-looking young man, is a shoemaker, in a country village. During the last five years he has suffered from deafness of the right ear, and during the last three months the left ear has also been deaf; with the right ear he cannot hear the ticking of his watch in any position; with the left he hears it only when applied close to the external organ.

A large collection of dark-coloured cerumen is found on both sides; more or less soft on its exterior, but very dense, adherent, and difficult to be dislodged,

much, or too suddenly exposed to the atmosphere after being so long covered from its influences.

As oil, glycerine, or stimulant drops have no specific power by which to restore the natural condition of the affected parts in such cases, and as it seemed not desirable to permit the inner surface of the meatus to become too dry, moistening with water seemed at first to be the most simple, as well as the most rational application; to this a very minute quantity of nitrate of silver was afterwards added, and this caustic was also rubbed upon the integument covering the mastoid process on both sides, a proceeding which may now and then be adopted as a convenient substitute for blistering. The great simplicity of such a case is the measure of its importance, and the frequency of its occurrence the reason why it should not be regarded as too trifling to occupy the surgeon's attention.

In connection with it, two separate matters are especially worthy of attentive consideration:—first, the actual condition of the ear as observed in such cases; second, the further accidents connected with hearing, or the chances of complete deafness to which it exposes the patient.

First — With regard to the actual condition of the ear, it should be borne in mind that indurated cerumen plugging closely the tympanic extremity of the external meatus, and pressing upon the delicate surface of the membrane of the drum, is capable, not only of preventing the due performance of the function of these parts, but also of irritating the nerves which supply them, or pass near to them, and likewise of exciting the action of their vessels, altering their nutrition, and hence of changing their form, size, colour, and general appearance, to say nothing respecting the possibility of ulceration of the tympanal membrane, and consequent disease of the drum of the ear itself.

There are many inveterate cases of deafness which have evidently arisen from the causes just enumerated, but where such causes have been too long in operation, and have effected a change of parts too well established to allow of complete return to the natural condition, hence often permitting but a very slight alleviation of the inconveniences from which the patient suffers ; a better reason could scarcely be given for a strong recommendation to those who are *beginning* to suffer from deafness to have its nature and cause determined as soon as possible.

in the deeper parts of the meatus, so that the scoop was required to aid the efforts of the syringe for the removal of these obstructing and irritating masses. The word irritating is specially chosen, in allusion to the effects produced by the long continued presence of this altered cerumen upon the delicate exterior surface of the membrana tympani, and the neighbouring or deeper part of the external meatus.

The left ear was first completely cleared, and a bright stream of sun-light then admitted through the cono-tubular speculum, when a condition of parts was observed which a pathologist might well call beautiful ; the membrana tympani had not its natural glistening appearance, except on a small portion at the lower part, but was completely opaque, or, if the expression may be allowed, was of a dead white colour, (this being most distinctly seen at its upper and outer part,) apparently from deposit of lymph beneath its external layer, for the external or conchal surface did not display any inequalities as if from morbid deposit upon it, but was apparently smooth, although opaque. The swelling and blood-red vascularity within the bony part of the meatus were very remarkable, even when the excitement produced by the syringing had passed away.

In the right ear corresponding appearances, but in extreme degree, were observed; the membrana tympani presenting a remarkable opacity, which had not spared any part of it; and at the same time a marked alteration of surface, which was rough and irregular — its smoothness having been lost in the effects of vascular excitement, irritation, and hindered function, which the long neglected cerumen, acting as a foreign body, seemed to have produced; the deeper part of the meatus was narrower than the corresponding portion of the left side tube.

The patient can inflate the left tympanum, and feels distinctly the entrance of the air; on the right side the feeling of its entrance is less distinct, but it is nevertheless perceived. After both ears were completely cleared, and the meatus and membrana tympani examined, the patient tried his audition by the watch, and found that with the right ear its ticking was heard at a distance of ten inches, and with the left at a distance of fourteen inches.

The patient was directed to moisten the ear with a little lukewarm water three or four times a day, and for a few days to wear a little cotton on both sides; thus keeping the surface clean, and not too

Secondly—Many patients who suffer from accumulations, or disease, or both, in the external meatus, have not at the same time any morbid condition of the Eustachian tube, and probably not of the tympanum, except at its exterior part, and may not, perhaps, be deaf in the extreme, but the external part of the acoustic apparatus being so materially hindered in its function, if the guttural part, or Eustachian tube, should happen to become obstructed, narrowed, or closed, in consequence of ordinary or specific inflammation, of enlarged tonsil, or other swelling affecting its guttural opening, or the presence of tumour, or other disease, in its vicinity, the two main channels of sonorous vibrations will be found closed at the same time, and the condition of the human being, if the comparison may be permitted, may in such cases be likened to that of some of the lower animals, such, for instance, as certain cephalopods, which have a nerve of hearing, and even a rudimentary labyrinth for receiving the impression of sound, but which are without any accessory acoustic apparatus, in connection with the atmospheric medium.

October 11.—Hearing distance seventeen inches on each side; on the left side two little black patches

of cerumen look, at first sight, like perforations in the membrana tympani, to which they are adherent ; they are easily removed from its surface. The patient this day states that he has not heard so well as he does at present for four or five years back.

Deafness from mixed Ceruminous Accumulation. Restoration
of Hearing. Remarks.

July 31, 1854.—J. D., æt. 43, a smith, has been deaf during the last three months, from complete stopping of the meatus on both sides with black and very firm cerumen — a state of parts not unfrequently met with in men who follow his occupation. The meatus being cleared on both sides, the hearing was at once restored.

When men do not attend much to sounds more delicate than the ringing of the anvil, fine hearing is relatively unimportant to them ; and we often observe that blacksmiths, shoemakers, and others whose occupations are such that conversation is not very essential to the progress of their labours, will endure for years

a diminished acuteness of hearing, even when this depends on ceruminous accumulation alone ; in blacksmiths this is very common ; the scoriæ and dust by which they are all day surrounded ensuring a gradual charging of the meatus with dark-coloured matter, which seems to mingle with the product of the ceruminous glands, and is too often left to itself, until a state of extreme deafness comes on.

The temporary deafness which prevails during the time the plugging of the meatus is allowed to continue, is not all the evil which may occur in cases of this nature ; for, if it so happen that the accumulated material has occupied the deeper part of the meatus, and has been in close contact with the membrana tympani, a morbid state of this membrane is not unfrequently produced ; it loses its peculiar glancing appearance, which is changed for an opaque condition, and with this a permanent diminution of hearing is not unfrequently associated.

Here we cannot fail to see the importance of certain hygienic attentions to the organ of hearing, and it is to be regretted that it is too often much neglected by those in whom such attentions are most needed ; and it may be well further to remark, that

a great proportion of the cases of deafness met with in practice arise from what might be regarded as very trifling causes, the evil influences of which, by timely care, might often be averted.

Deafness from Accumulation of Cerumen.

July 17, 1854.—T. H., æt. 13, a dark-complexioned and delicate-looking boy, has been deaf during the last seven years; the hearing is worse when the patient has a cold, and although the sensibility of the acoustic nerve seems to be not of the finest kind, the deafness is evidently in a great measure owing to ceruminous accumulations closely plugging the meatus on both sides, and putting the membrana tympani completely out of sight. After clearing the meatus the hearing was much improved.

The case illustrates the manner in which parents will allow deafness to continue for years, unattended to, even when it is originally of a simple character, and capable of immediate relief.

**Tinnitus. Ceruminous Accumulation. Opacity of Membrana
Tympani.**

October 18, 1854.—H. M., æt. 6, became deaf three weeks ago, and the difficulty in hearing has since gradually increased, so that his mother is obliged to shout to him; he tells her there is a whistle in his ear, and asks if she does not hear it; he is pale and feeble, and his bowels act irregularly. The meatus on both sides is charged with cerumen.

The external canals cleared, the membrana tympani was found to be slightly opaque.

November 2.—The weather is now very cold, and the deafness is accompanied with pain in the ears, but when the patient is warmly clothed, or comfortably placed by the fire-side, both the pain and the deafness are lessened.

In such cases hygienic attentions are of more importance than therapeutic agents; without the aid of the former, the employment of the latter will often fail. Friction of the skin in these cases is especially worthy of notice; this patient was sponged over the whole body with warm vinegar and water, every morning during the time he was under treatment;

the sponging was followed by brisk rubbing with a rough towel, sufficient effort being made to produce a complete rubefaction of the tegumentary surface.

December 2.—In two months after the commencement of the treatment, the deafness and tinnitus were removed, and the general health much improved. It is worthy of remark that the patient in this case should have likened his tinnitus to the sound of a whistle, and that *he* should have imagined that others might hear it as well as himself.

Obstruction of External Meatus. Remarks on Complications.

October 15, 1853.—E. C., a female, æt. 55, has been deaf during the last two months; she attributes the alteration in her hearing to exposure to cold. The Eustachian tube appears to be in good condition, the tympanum being easily inflated on either side. There is considerable ceruminous accumulation in the external canals, which being removed, the tympanic membranes are seen to have their natural appearance at the bottom of the meatus.

The obstruction of the meatus being removed, the power of hearing is increased; the tick of the

watch is now heard four inches from the ear on either side ; it was previously heard, but indistinctly, even when closely pressed against the auricle ; nevertheless, the hearing is far from being fully restored. Blisters to be applied to the mastoid process, aloetic aperients, with blue pill, to be freely administered ; the diet to be well regulated ; late hours, and exposure to cold, avoided.

October 20.—The treatment above mentioned has done good ; the hearing is better than before, but, nevertheless, imperfect as yet ; and, the age of fifty-five being taken into account, it is not improbable that the present slight deafness will not completely yield to treatment. The patient has occasionally suffered from rheumatism, and a course of sarsaparilla and iodide of potassium is now commenced. It is well to bear in mind that patients who begin to complain of deafness at this period of life will often speak of their attack as one of very recent occurrence, when symptoms and appearances show tolerably well that morbid alterations in the organ of hearing have existed for a considerable time ; in short, it is easily discovered that the deafness has been insidious in its progress, and has gradually increased, but has only

attracted particular attention, or been much complained of, from the time when it became severe; these considerations may be regarded as of some importance, more especially with regard to prognosis; for, in ordinary cases, and in younger subjects, a deafness of two months' standing would be likely very soon to yield to treatment; but, in patients advanced in life, more especially in females, at, or beyond a critical age, a very careful examination of all the various conditions and circumstances of the case should be made, before any opinion, more especially a favourable one, be given. The remaining deafness, in this case, probably depends upon alterations of parts of the ear which cannot be exposed to view.

Chronic Inflammation of Auricle.

October 25, 1854.—Mary N., æt. 21, received a blow on the left ear, nine weeks ago; the external ear is enormously enlarged in the upper part of the lobe, and back of the concha; deeply red, rough, and sebrous on the surface: these changes, which have now existed several weeks, appear to depend,

in great measure, upon an impoverished and bad state of constitution, shewing itself in a part of comparatively feeble vitality.

Tonics and nutritious diet are recommended ; a solution of the nitrate of silver being painted once a day over the affected part of the ear.

November 10.—The patient improves under this treatment—the diseased part being already much reduced in size.

Inflammation of External Meatus.

September 26, 1854.—J. K., æt. 30, a strong woman, suffers from deafness on the left side, which followed “a slap on the side of the head,” which she received about three weeks ago. The lining membrane of the meatus is much thickened, so that the calibre of the canal is very narrow.

In this case, leeches, blistering, alterative aperients, and afterwards iodide of potassium, were freely used, but after all considerable thickening of the lining membrane of the meatus was left behind ; the hearing, however, improved during the employment of the treatment just mentioned.

Abscess pointing into the Meatus.

September 30, 1854.—T. Q., æt. 11, a fair-complexioned, healthy-looking boy, suffers from a large phlegmonous abscess of the parotid region, on the left side; the swelling is so great that the fold of skin turning round the angle of the jaw is obliterated, and the anterior and lower parts of the ear are put very much on the stretch. The collection is just pointing within the meatus, through the lining membrane, at its anterior part; and the lancet being applied, and a somewhat free opening made, a tablespoonful of pus came forth. The inflammation occurred about fourteen days ago, and during this time deafness has prevailed.

The patient speedily recovered after the discharge of the pus. In these cases it need not be said that early, and commonly free opening of the abscess, is desirable, lest the lining of the meatus should be so altered by morbid action as to lead to a state of permanent thickening of this tunic, which might seriously interfere with audition.

Abscess behind the Ear.

November 5, 1854.—A. T., æt. 16 months, a fair-complexioned girl, has an abscess behind the left ear, of the size of a pigeon's egg; it pushes the auricle forward, so that this part now stands with its edge looking directly outwards, more or less like the ear of a little baboon.

A free opening was made into the most prominent part of the tumour, and thus the matter at once discharged; the cavity of the abscess rapidly filled up, and the cure was soon completed by cicatrisation.

Abscess in the aural region, more especially behind the ear, in infants, should seldom be allowed to wait for spontaneous bursting; the matter is very near the bone, and the periosteum in these cases may after a while be attacked, and caries of the osseous texture may follow. Such collections should be opened at the most dependent part, thus giving the matter the least possible chance to burrow around the outer part of the external meatus. We occasionally see cases of this kind in which hearing, and some in which even life, is lost, for want of early and active treatment.

Eczema of the Auricle.

October 3, 1853.—M. M., æt. 25, a sempstress, suffers from eczema of the right auricle, which is reddened and hot, with swelling of the cuticular lining of the meatus, but without deafness ; this was preceded by a similar affection of the left auricle, which first commenced four years ago, previous to which, she says, she had suffered during twelve months from a like complaint of the eyelids, on both sides. The patient has suffered from amenorrhœa during the last six months, with constipation, loss of appetite, palor, and debility.

November 3.—During the last month a course of aloetic aperients has been given : and of late the citrate of iron and quinine, with decided benefit to the general health. Out-door exercise was from the first strongly recommended, and has been taken as far as the strength and ordinary occupations of the patient would allow.

The ear is quite well, but the catamenia have not yet reappeared. In this case water dressing seemed to be most beneficial to the affection of the auricle.

Eczema of the Auricle.

October 21, 1853.—Jane B., *æt.* 3 years, has the left eyelids, half the left cheek, the entire surface on both aspects of the left auricle, as well as the lining of the external meatus within it, covered by an eczematous eruption; in connection with which there is a profuse otorrhœa, the yellow, thin, purulent fluid of which now bathes the interior of the left auditory canal, and prevents the membrana tympani being seen; and the thickening of the eyelids, and irritation of the eye from conjunctivitis, equally interfere with inspection of the organ of vision. A corresponding change is already taking place in the opposite ear, but as yet it is merely incipient. The eczema commenced by a spot on the left upper lid, and without any obvious cause or previous ailment which had attracted attention. The child has the aspect of good health in other respects, with light hair and very fair complexion.

The burning heat of the affected parts, the deformity produced by the eruption, the deafness from alteration of the aural surfaces, and the purulent discharge by which the meatus is filled, along with

the morbid condition of the eye, form altogether a list of evils not unworthy of serious attention.

This affection has now existed several weeks, and seems to require mild local applications, tonics, and good diet, with the requisite attention to temperature, and the exclusion of intense light.

November 15.—The greatest suffering being produced by the state of the eye, this part was exposed to the vapour of hot water poured upon camphor previously thrown into a basin, over which the face of the patient was held. A marked diminution of the photophobia followed this practice, which was repeated three times a day during ten days,—rhubarb, and mercury with chalk, being occasionally administered; and the solution of acetate of ammonia, with a very minute quantity of laudanum, at the same time given; this treatment was followed by a course of citrate of iron and quinine, and meanwhile the meatus was carefully washed out three times a day, and after each washing a weak solution of nitrate of silver was applied to it, the eczematous surface generally being treated with water dressing.

This course of soothing applications and remedies, with subsequent tonics and good diet, was followed by

marked improvement ; the photophobia vanished ; the cheek and auricle regained their natural appearance ; and at the end of six weeks from the commencement of the treatment, the otorrhœa was scarcely perceptible, and it was easily observed that the hearing of the child was much better than before.

Although, in some of its features, this case closely resembled one of ordinary strumous ophthalmia, in its mode of origin, it differed from this malady ; and in its progress, when the conjunctivitis prevailed, it was not characterised by any phlyctenæ observed on the surface of the mucous membrane of the eyeballs. The case, as a whole, serves to illustrate the connection, in a practical point of view, of diseases of the skin, eye, and ear, and suggests the remark that to understand well the varied maladies which may affect the fine organs of sight and of hearing, it is a desirable preparation to be previously acquainted with the maladies which attack the tegumentary covering of the body — to say nothing of affections of the mucous membranes generally — which are capable of telling upon the organs of sense, or, with which, these organs may sympathise.

Eczema of the Ear.

October 22, 1853.—J. C., æt. 6 months, a male twin, has the meatus, on both sides, stopped by a hardened material, resulting from the drying of an eczematous eruption on the part, which affects the scalp, as well as the external ears.

Effects produced on the ear by the presence of the *crusta lactea* should not be passed over without due attention, for if the external meatus remain plugged up for any considerable length of time, its lining membrane may become diseased; opacity, or even ulceration of the *membrana tympani*, may occur; and in this way the hearing may be irreparably damaged, or even completely lost.

In this case relief was obtained by the occasional employment of warm olive oil, along with the careful use of the syringe.

Tinnitus. Eczema of Auricles.

November 1, 1853.—Mary T., æt. 62, has had nine children, and always enjoyed good health; her last child was born in her fortieth year, and she has not

menstruated since. Twelve months ago an eczematous affection of the auricles commenced, after she had previously suffered during about nine years from a corresponding affection of the vulva, and within the last six months the same cutaneous disease has affected the eyelids, as well as the front of the cheek.

November 28.—Has now taken, three times a day, two tablespoonfuls of a mixture containing two drachms of Donovan's solution to twelve ounces of the compound decoction of sarsaparilla, under the influence of which the cutaneous affection of the ears has disappeared.

Complains of tinnitus, and says that she cannot hear other sounds from listening to that in her ears, which is compared to "many a thing"—such as "bells," "grasshoppers," "tumult," &c.

The mucous membrane of the throat is unhealthy, rough, granular, and dark red in colour; the inflation of the tympanum from the Eustachian tube is but very faintly heard. The meatus being dry, a little oil was directed to be dropped into it occasionally.

This patient was much relieved from the burning and irritation of the eczematous auricles by the application of a lotion of glycerine and water, with a

little extract of opium. The tinnitus diminished after the employment of the warm bath, and the administration during a fortnight of five drops of Fowler's arsenical solution, given with a little syrup of ginger and water three times a day.

Eczema of Auricle.

May 2, 1854.—Edward C., æt. 20, suffers from thickening of the external ear, so much so that the meatus, on both sides, is closed; eczema affects the surface, and an ichorous discharge proceeds from within the meatus. The hearing is but little affected.

In this case a few doses of blue pill were given, and the compound decoction of sarsaparilla continued for about six weeks; at first, water dressing was used, and afterwards a weak solution of nitrate of silver was painted over the entire surface of the auricle once a day, and also dropped into the orifice of the meatus, after previous ablution of this part.

About two months after the commencement of the treatment, the auricle had assumed its natural appearance; the meatus, however, was yet seen as

a narrowed canal—the thickening of its lining membrane being very slow to yield.

Cutaneous affections of the auricle are common in children, and not unfrequently met with in patients advanced in age; but they are more rare in the middle periods of life, if we except erysipelas, and inflammation from the influence of external agents.

During the progress of diseases of the scalp, affections of the back part of the auricle are common in children; these should always be attended to as soon as they make their appearance, lest the inner part of the meatus take on some form of morbid action, and a chronic otorrhoea be set up; in children, and in the young, such affections of the auricle have not generally anything very special about them, and their diagnosis is not commonly attended by any difficulty; but in patients more advanced in age, the diagnosis may be less easy, for while, in the young, affections of this kind very commonly belong to the effects of common inflammatory action, in older patients some form of specific disease has more frequently come into play in causing their appearance.

Alterations resulting from external injury, from

cold—as in cases of chilblain of the ears—or from phlegmonous inflammation occurring without any very obvious cause, will at once be recognised, and herpetic, or eczematous eruptions, whether or no connected with affections of the scalp, need not give much trouble; to which we may add, that pemphigus, or pemphigus gangrenosus—as met with in Ireland—as well as lapoid affections, now and then require attention; and those connected with the rheumatic and gouty diathesis, or with syphilitic disease, are worthy of especial notice.

Gangrene around the Ear, from Measles.

September 19, 1854.—Wm. J., æt. $2\frac{1}{2}$, had measles about six months ago; the eruption remained out but one night, and the child became very feverish after its disappearance. At present a large opening exists behind the upper part of the right ear; purulent matter runs from it, and a burrowing destructive process is going on in the neighbourhood of the mastoid process; meanwhile no important change has occurred within the meatus, but the child is feeble, irritable, and

pale, and suffers from great derangement of the general health. This child sank under the influences of gangrenous destruction of the parts alluded to.

In cases of this kind it is of the utmost importance to keep the neighbourhood of the ears, as well as the interior of the auditory organ, perfectly clean, and free from sources of irritation, for inflammatory action started during the prevalence of so unfavourable a state of the system is very apt to take on a very unhealthy aspect; and the occurrence of such action is in some cases favoured by want of due attention to the state of the meatus and neighbouring surfaces.

Gangrene of Ear.

April 2, 1855.—Mary S., æt. 8 months, suffers from gangrene behind the left ear; the ear, generally, is swollen, its integument destroyed by gangrene, and the opposite integument of the head is lost from the same cause; this began as a small red spot on the head, behind the middle of the ear, two months ago; the ear was first affected about a week ago, and is now *nearly separated* by the progress of the gangrene.

A small, and deep excavation, from gangrene, is found behind the middle of the left thigh, another over the great trochanter, on the same side, and a third on the outside of the middle of the right thigh.

The little patient had an eruption "like the hives, which she scratched very much," about three weeks ago, and the scratched parts became gangrenous.

April 3.—The patient sank from the progress of the gangrene. In cases of this kind the time for doing any good has too often passed away before the practitioner is consulted respecting the gangrenous affection; the patients are commonly very young children, frequently of poor parents, living in insalubrious localities, where the associations of poverty interfere sadly with the benefit of remedial agents. These cases are occasionally both numerous and formidable, at times when scarlatina, with throat affection, or *cancrum oris*, prevails.

SECTION III.

Affections of the Membrana Tympani.

IN cases of inflammation of the membrana tympani, it is worthy of remark that the diseased action is seldom confined to this one small, though important, part of the economy of the ear; such inflammation may be preceded, or accompanied, by morbid action within the tympanum, or within the external meatus, or in both these parts at the same time; and, if the disease be observed at an early period, a sort of general otitis may be found to prevail; if noticed at a later period, we may probably find that one part of the previously diseased ear has recovered more than another, and it often happens that the membrana tympani retains very well marked traces of morbid action, when the meatus and tympanum are apparently less affected.

In the practice of aural surgery, chronic affections of the membrana tympani are much more commonly met with than acute; of these, opacity, partial or

complete, and with or without thickening of the membrane, and with or without otorrhœa, is amongst the morbid conditions most frequently observed ; this state of the membrane is found to be associated with very different degrees of deafness in different cases ; but it should be borne in mind that the difference in the degree of deafness, although it may often depend mainly on the different degrees of change which the membrana tympani has itself undergone, will, nevertheless, in some cases, depend, in great measure, on the alterations which have taken place at the same time in other divisions of the auditory apparatus ; hence, it is easily understood, that in such instances, even the restoration of the membrana tympani to its normal condition (if this were possible) would not alone suffice for the complete restoration of perfect hearing. Of other changes in the anatomical condition of the ear that have taken place at the same time with the morbid alterations of the membrana tympani, some may be observed in the external meatus, some may be met with in the Eustachian tube and tympanum, while others may affect the labyrinth and acoustic nerve, and thus be out of the reach of physical diagnosis.

Alterations of the external meatus are, for the most part, easily observed, and will be best studied with the aid of bright solar light, with or without the speculum; the changes which have taken place near to the membrana tympani being best seen with the aid of the instrument, while those which have occurred near to the concha are more easily observed without it.

It is worthy of notice that the prognosis in cases of deafness associated with alterations of the membrana tympani must, in some cases, be influenced considerably by the state of the external auditory canal. If otitis have been of long duration, the lining membrane of this canal, as well as the membrana tympani, may be considerably thickened; and, in such cases, it is evidently probable that the tympanum and labyrinth may not have escaped the influences of morbid action, the wide spreading of which is indicated by the visible conditions of the external ear; and hence it is obvious that the chances of recovery, if this expression may be allowed, which might be moderately favourable if the membrana tympani alone were affected, become less promising when other parts of the ear have

suffered at the same time; so that a case of deafness with opacity of the membrana tympani, but with a healthy condition of the external meatus, permits a much more favourable prognosis than one in which, along with the alterations of the membrana tympani, we have, at the same time, a narrowing of the external meatus, more especially of its deeper or bony part, which has already been of long duration.

The prognosis is still less favourable if, along with opacity of the membrana tympani, and narrowing of the external meatus from thickening of the soft parts within the canal, there is also alteration of the Eustachian tube, be this, stricture of the passage, or any form of obstruction within it which hinders the free circulation of air in the middle ear; for such a state of parts is sure to lead to a morbid condition of the tympanum, or to increase such a state if it previously existed; and it need scarcely be added that the nature of the case is rendered much more serious, and the probability of recovery far less, if any affection of the labyrinth, or of the cerebral side of the acoustic apparatus, at the same time prevail.

Inflammation, or its consequences, met with in

the membrana tympani, when studied with a view to treatment, require to be noticed in connection with the age, constitution, diathesis, habits, and previous ailments of the patient; while the proximate cause of the malady, its duration, and the treatment, if any, hitherto employed, should be carefully passed in review. Struma, gout, rheumatism, syphilis, mercurial courses, scurvy, exanthematous and other fevers, and advanced age, as well as the parturient state and some of its earlier consequences, demand especial attention in connection with affections of the membrana tympani, while cutaneous diseases generally are not less worthy of notice.

The cases which follow supply a few illustrations of the character and modes of occurrence of some of the most frequent, and hence the most interesting, of the morbid conditions of the membrana tympani. Cases of perforation of this membrane have been previously given, and those instances in which there is merely a change of form in the membrane without any other alteration, will not be especially dwelt upon here; this change of form is rarely seen except in that alteration of the membrane which increases its external concavity; that state in which the membrane

is said to be rendered convex externally being so extremely rare that even its occurrence has been denied.

In cases where the external meatus is capacious and unaltered, the condition of the membrana tympani is easily seen, and hence its observation belongs to the easier part of the diagnosis ; but it very frequently happens that the accompanying affections of the other parts of the auditory apparatus demand a very elaborate and pains-taking enquiry, in order to enable us to determine with satisfactory precision the relative value of the physical signs they may present, or of the rational symptoms which they may send forth.

Deafness.

Deafness in advanced age. Alteration of the Membrana Tympani.

October 12, 1853.—Mr. H. B., is 73 years of age, and has been “hard of hearing” for many years, so that, in addressing him, shouting is required. The external ear is of normal aspect, but the membrane of the drum is considerably altered in appearance ;

on the right side, where he is most deaf, it has a white, thick, leathery look, over its entire surface; in the opposite ear, which is not quite so deaf, the same appearance is found to affect the lower part of the membrane only.

It is worthy of remark, that in cases of this kind, where alterations of the membrana tympani, such as those above noticed, are observed, we meet with extreme deafness; deafness even greater than that which accompanies, in some cases, the total loss of the membrane of the drum; so that it is only fair to suppose that the great loss of audition, in a case such as the one related above, is not altogether accounted for by the alterations observed in the tympanal membrane; hence deeper and invisible changes in the tympanum, labyrinth, or acoustic nerve, must be passed in mental review, as probable sources of some part of the deprivation from which the patient suffers.

This is an interesting case of that form of deafness not unfrequently observed at a very advanced period of life, and for which remedies are often useless. The morbid changes which exist have probably been produced in a very slow and gradual way, and without the occurrence of any painful inflammatory affection;

indeed, it would seem that the membrana tympani, in patients of advanced age, now and then loses its transparency, and assumes a dull white, or light brown colour, which reminds us of the alterations of the outer rim of the cornea in cases of arcus senilis, and which appears to come on as insidiously as old age, and without any premonitory symptoms of diseased action.

Opacity of the Membrana Tympani.

October 13, 1853.—A. B., a butcher, æt. 38, is extremely deaf: the membrane of the tympanum is opaque on both sides; the neighbouring part of the lining of the meatus is thickened and red.

Deafness from chronic inflammation, with thickening and opacity of the membrana tympani, is very common amongst people who stand in open shops, daily exposed to the vicissitudes of the weather; and the treatment of such deafness, as may be expected, is not unfrequently very unsatisfactory, the patients, in most cases, continuing to be exposed to the influences which at first led to the loss of hearing.

The tympanum is completely inflated on both sides.

A seton was passed into the nape of the neck ; a course of "iodide of potassium, with sarsaparilla, recommended, and the cessation of spirit drinking enjoined.

In this case the seton was decidedly useful, the deafness diminishing considerably in the course of a month, without, however, being entirely removed : chronic affections of this kind, if the expression be permitted, generally do best with chronic remedies ; and the continued discharge kept up from the canal of a seton is often more beneficial than the abstraction of blood by cupping, or leeches, the effect of which, in a strong man, very soon ceases to be felt.

Opacity of the Membrana Tympani, from damp applied to the Head. Amenorrhœa.

October 21, 1853.—M. A. B., æt. 29, had very good hearing until the age of 13, when she became deaf, in consequence, as she believes, of the habit which she got into, along with her play-mates, of soaking her hair, of which she had a great quantity, in cold water, then partially drying it, but allowing

it, in reality, to remain damp while she sat in school during the remainder of the day.

Right hearing distance is one inch, for the tick of the watch ; but on the left she cannot hear the tick at more than half an inch from the auricle.

The auricles have their normal aspect ; the meatus is wide, without cerumen, and dry, and the membrana tympani of a dull white, and apparently thickened on both sides ; this state of the membrana tympani appears to be the main cause of the deafness, the tympana being easily inflated.

The patient says that she is scarcely ever free from face-ache and tooth-ache, and has often had gum-boils, and now and then, along with such attacks, the deafness is increased ; she has not, however, suffered from any ear-ache worthy of mention ; the dental arches are in bad condition, some teeth being lost, while stumps of decayed molars are seen in both the upper and lower jaws.

The first menstruation occurred at 14, after which amenorrhœa prevailed during three years, the second appearance of the catamenia occurring at 17 ; between these two ages of 14 and 17 a gradual loss of hearing was going on.

The patient wears an artificial eye in the left orbit, and there is central cataract in the right eye, her eyes having suffered from ophthalmia, which commenced the third day after her birth, and left behind it an atrophied state of the left eye, as well as the central cataract in the right.

In this case remedies were of no avail. It affords, however, an interesting illustration of that kind of injury to the organs of sense which is so frequently observed in connection with derangements of the uterine or mammary functions in females, for which occurrence there is a sort of *analogue* often observed in men, where amaurosis, or cataract, but more frequently the former, follows the sudden stopping, or spontaneous cessation of a profuse, long-continued, or periodical discharge from piles.

A lady, now under my care, has all at once become completely blind, on the cessation of suckling; she had formerly lost one eye completely from staphyloma, and the vision of the other was impaired by ophthalmia, which left behind it a fixed and contracted pupil, with partial opacity of the lens; during the lactation above alluded to the vision improved very

much, so that reading and sewing were practised, but within a week after weaning the child total blindness came on ; the eye, as a whole, looking more clouded, and the lens more opaque than before.

Opacity of the Membrana Tympani.

November 3, 1853.—A. B., æt. 59, a lady from Boroughbridge, who has always enjoyed good health, has been deaf during the last nine years ; the left ear is much more affected than the right, and on examination the anatomical condition of its membrana tympani seems, it may be said, to correspond with the physiological defect, for it is throughout of a pearly white, without any trace of vascularity, and is not in any way affected in position or colour by inflation of the tympanum through the Eustachian tube.

The patient attributes her deafness to cold, but gives no very satisfactory account of the symptoms which prevailed at the commencement of the complaint, or of the nature or rate of its earlier progress ; it has, evidently, been a case of neglected chronic

myringitis, little or not at all attended to until its established effects have caused an amount of deafness which art can only alleviate to a very limited extent.

In the right membrana tympani the central part is normal, the periphery opaque ; in connection with which, it is, perhaps, worthy of remark that, in some individuals, this opacity of the rim of the tympanal membrane is apt to occur at a comparatively early period of life, without being associated with any morbid condition that attracts the attention of the patient.

Opacity of the Membrana Tympani.

May 21, 1854.—J. L., a young man of 19, is very deaf on both sides ; the affection is attributed to cold, is recent, and is associated with thickening of the lining membrane of the deeper part of the meatus, and with opacity of the membrana tympani.

May 28.—The meatus, on both sides, has been kept in a very clean state during the last week ; glycerine has been from time to time dropped into both canals ; blisters have been applied behind the

ears ; and colocynth, with blue pill, and infusion of gentian, and Epsom salts, administered.

July 8.—The patient is quite cured of his deafness ; but wears a little cotton in each ear, as he says, to prevent “humming,” which troubles him as soon as the portion of cotton is removed, more particularly on the right side.

The condition of the deeper part of the meatus is improved, its calibre being widened. This was regarded as a very favourable recovery, the occurrence of which was, doubtless, in great measure, owing to the early period at which the treatment required was resorted to ; after a few months’ longer duration of the malady it would have been much less likely to yield easily to the influence of remedial agents.

Opacity of the Membrana Tympani.

June 21, 1854.—J. M. K., æt. 7, a healthy-looking, fair-haired, and blue-eyed little boy, became deaf without any apparent cause, in the winter time, about eighteen months ago ; he complained of ear-ache, but has not had any otorrhœa ; and there has

not been any throat affection associated with the aural complaint.

The right ear was observed to be first affected, and in this ear the membrana tympani is opaque, from the progress of inflammatory action, which probably occurred first in the tympanum, and of which the ear-ache was a symptom.

In this case a blister applied behind the ear was kept open during a fortnight, with marked benefit to audition. It is worthy of notice that blisters seem to tell more favourably upon cases of this kind in children than they do in patients advanced in age ; it is, however, reasonable to suppose that in children, or young people where the nutritive function is active, a greater amount of effect will be produced by the influence of continued discharge from a vesicated surface than we should be likely to have in those whose organisation is less readily affected by agents of this kind ; hence we seem to have greater facility for the removal of opacity of the membrana tympani, or of thickening of the lining membrane of the meatus, in young than in old subjects : this is but one small fact ; it suggests, however, some very important considerations in connection with the superior

advantages we possess for the treatment of disease in the earlier periods of life, or while the gradual development of the organisation is in progress, and for which we have the counterpart in the disadvantages associated with the employment of remedies during the gradual decay of advancing age, in the later periods of life.

Chronic Inflammation, and Opacity of the Membrana Tympani.

July 21, 1854.—J. K., æt. 43, a labourer, is employed in “vitriol works,” and much exposed to great heat, and sudden changes of temperature. He has been deaf two years, and attributes his loss of hearing to the causes above alluded to.

On the left side the watch is not heard when closely pressed upon the auricle, and on this side the entrance of air to the tympanum is not perceived with the otoscope, so that here the Eustachian tube requires attention. On the right side the entrance of air to the tympanum is heard with the otoscope, and on this side the ticking of the watch pressed closely against the ear is perceived.

The most obvious anatomical alteration observed on both sides, is opacity of the membrana tympani, with redness, and thickening of the lining of the neighbouring part of the meatus.

This patient was leeched, had blisters behind the ears, and afterwards an issue in the nape of the neck: a weak solution of nitrate of silver was dropped into the meatus, night and morning, during a fortnight, the patient the while being kept at home, and in a month after the commencement of this treatment, great improvement in the hearing had taken place; there was some reason to think that this favourable alteration in audition was in part owing to the injection of air into the Eustachian tubes, a practice which was resorted to once every day, until the hearing had considerably improved; the apparatus employed was the Eustachian catheter, with the elastic bottle applied to it. This injection was completely successful in restoring a more normal condition to the middle ear of the left side, after which the air blown through the Eustachian tube could be distinctly heard to enter the tympanum. The thickening and redness of the lining membrane in the deeper part of the meatus were removed by the treatment above noticed,

but, although the hearing was much improved, there was no very remarkable alteration in the appearance of the membrana tympani ; to which it may be added, that under the most favourable circumstances the transparency of this membrane, when once lost, is not soon regained.

In about six weeks after the commencement of the treatment the tick of the watch was heard at a hand's breadth from the left ear, while, on the right side, it was perceived at nearly twice this distance.

Opacity of the Membrana Tympani.

August 14, 1854.—J. M., a strong man, æt. 50, suffers from extreme deafness, associated with opacity of the tympanal membrane, which appears to have been produced by chronic morbid action, set up by his frequent exposure to wet and cold.

The seton is passed into the back of the neck.

The seton was introduced on the Monday ; on the Tuesday, Wednesday, and Thursday following, the patient was quite elated with the improvement in his hearing ; on the following day (Friday) he thought

that he did not hear quite so well ; but even on this day (the fourth after the introduction of the seton) it was obvious that he heard better than before. The excitement caused by the employment of the seton seemed to have produced some effect on the audition of the patient before any purulent discharge could possibly have told upon the malady in the ordinary mode of action ; it should, however, be borne in mind, that a remedial agent of this kind may tell favourably as a counter-irritant before the derivative influence of the purulent secretion can take place.

The seton was allowed to remain in the neck for two months, during which time the hearing of the patient gradually improved ; normal audition, nevertheless, was not completely regained. The Eustachian catheter, and the elastic bottle for the injection of air, were several times employed, after which the inflation of the tympanum was more complete than before. The opacity of the tympanal membrane did not appear to undergo any very remarkable change ; and it seems not improbable that the improvement in hearing is due, in great measure, to alterations which have taken place within the tympanum ; and,

with regard to many instances of ear disease, it might be observed that opacity of the membrana tympani, itself a malady, should also be regarded as a symptom of deeper alterations which the more internal parts of the auditory apparatus may have undergone.

Opacity of the Membrana Tympani.

September 9, 1854.—J. H., æt. 42, a healthy-looking, strong labourer, has been deaf during the last two years. In the left ear the membrana tympani is marked by opaque patches, with less altered portions of membrane between them; the external surface of the membrane is very concave, and the manubrium of the malleus very well seen. In the right ear the exterior concavity of the membrana tympani is very remarkable; still more so the projection of the manubrium of the malleus, towards, or into the meatus, the membrane being folded round it in a manner which reminds one of the disposition of certain serous membranes which inclose projecting organs. The Eustachian tube is pervious on both sides.

This patient was accidentally seen, and not placed under any treatment.

In another case, somewhat similar, in which a remarkably dry state of the meatus also prevailed, improvement in hearing followed the frequent washing of the meatus with lukewarm milk, and the subsequent instillation of glycerine.

The exterior concavity of the membrana tympani in the case above related was so very remarkable, that it suggested the thought as to whether obstruction of the Eustachian tube, and alteration of the air in the tympanum, had not at some former time prevailed.

Deafness, occurring immediately after the application of Cold to the Head. Opacity of the Membrana Tympani.

October 20, 1854.—M. O., a female, æt. 39, of dark complexion, has been exceedingly deaf during the last eighteen years; of the mode of occurrence of her deafness she gives the following account:—One summer's day, in May, when very much heated, and perspiring, she washed her face and ears with cold water, giving the ears, as she expresses it, “a good swilling”; this was done at three o'clock p.m.,

and at five o'clock in the evening of the same day, or in two hours after, she had already become extremely deaf.

At present, loud shouting is required to enable the patient to hear. The watch, closely pressed to the auricle, is heard on the left side, but not on the right. The membrana tympani is opaque on both sides ; the Eustachian tubes are pervious.

In this case it did not seem probable that any benefit would be derived from the employment of any therapeutic agent ; for the Spanish proverb relating to the difficulty of curing deafness of long standing is not without value :—

Sordera que tres años dura,
Tarde o' nunca se cura.

The mode of occurrence of the deafness in this case is peculiarly interesting : the sudden application of the cold to the ear, previously much heated, would seem in some way to have partially paralysed the acoustic nerves ; in other words, the injury must have told at once upon the parts essential to hearing, inasmuch as any change which the accessory parts of the auditory apparatus could have undergone in so short a time would not easily account for so marked a diminution of audition ; and it may be further

remarked that the alteration which so rapidly took place must have occurred independently of inflammatory action, for such action had not time to precede, and it does not appear to have followed, the loss of hearing.

It should, however, be borne in mind that the occurrence of a true paralysis of the auditory nerve, is not the only supposition which helps us to account for the loss of audition in a case of this kind, for it is possible that the application of cold may have exerted some influence upon the delicate serous membranes of the labyrinth, by virtue of which the quantity, quality, or movements of their contained fluid have been disturbed ; and indeed it is not difficult to imagine that, by sudden alteration of the serous surfaces in question, their ordinary secretion may have been stopped, and its subsequent formation prevented by the effects of diseased action, which may have led to the partial or complete filling up of some of the tortuous canals of the internal ear with products of the morbid process, thus, as it were, glueing together surfaces which were previously separated, and hence annihilating canals essential to the movements of sound.

But, without supposing the canals of the internal ear to be closed by morbid action, the deafness in question may be adequately accounted for by supposing a suppression of the secretion of the fluid of the labyrinth, whence the influences exerted by sonorous vibrations through the medium of the ossicula upon the membrane of the fenestra ovalis, would, of necessity, be in great measure lost, and the normal value of the membrane of the oval opening, vibrating between air on the one side and fluid on the other, reduced to a minimum condition; for the labyrinth is now supposed to want its fluid, to be empty, or to contain some gaseous product, arising out of the alteration of its own surfaces, or out of changes taking place in its normal contents, so that the ear, if such fancied analogies may be allowed, would have two drums instead of one.

The changes in the internal ear are probably not precisely the same on the two sides; the tick of the watch, closely applied to the ear, is heard on one side, but not on the other.

Patients suffering from deafness of this kind often seek relief when the malady has already existed very long, and when treatment is commonly useless; if

they should have the good fortune to apply at once, immersion in the hot bath, leeches, blisters, aperients, calomel, and antimonials, might be brought to bear upon the case at first; and counter-irritants applied to extensive surfaces, setons, galvanism, and loud sounds, would not be unworthy of the notice of the practitioner in the after progress of the case.

The state of periodical discharges, whether normal or morbid, in such instances, demands especial attention, for any suppression of the catamenial or haemorrhoidal discharge, occurring from any cause during the course of the treatment alluded to, would be very likely to interfere with its utility.

The occasional observation of cases of this nature suggests the thought that the effects produced upon the labyrinth by impressions of cold have not hitherto been adequately studied; it is, however, quite obvious that there are great difficulties in the way of pursuing pathological enquiries in connection with such a subject.

In the case just related, the alterations in the accessory parts of the ear, did not seem to account for the extreme deafness which we have just attempted to view in connection with possible morbid changes in the labyrinth.

Extreme Deafness. Opacity of the Membrana Tympani. Affection of the soft Palate, Eustachian Tube, and Tympanum.

November 13, 1854.—J. F., æt. 40, is “shouting deaf” ; even very loud shouting, with the mouth very near to his ear, is required to enable him to hear at all. This deafness is of twenty years’ duration, and is attributed to the effects of cold ; getting the feet wet being mentioned as the main source of the malady.

The otoscope being applied to the external ear, air is heard to enter the tympanum on both sides. The membrana tympani is opaque, and florid red granulations grow from the lining membrane of the meatus, at its tympanal extremity, partly hiding the membrane from view ; this remark applies to both sides. The uvula is of enormous size, hanging down below the base of the tongue ; and the velum, as a whole, is large, and looks soft and flabby.

It is probable that a diseased condition of the lining membrane of the tympanum has long existed in this case ; in other words, that the anatomical alterations already described are but parts of a great whole, and themselves less influential in the production of the deafness than are the supposed changes which

are out of sight; for, in such instances, it is not likely that we should have a perfectly healthy state of structures on the inner side of the membrana tympani, where so much disease is visible on its exterior, for the progress of morbid action is not always restrained within the artificial limits of general anatomy; so that granulations, bands of adhesion, thickened, velvety, or fungoid state of mucous membrane, ankylosis of the ossicula, disease in or about the membrane of the fenestra ovalis, or rotunda, to say nothing of changes in connection with the openings of the mastoid cells, or Eustachian tube, may be reckoned more or less amongst the probable alterations within the tympanum, for the position and circumstances of the patient, as well as the antecedents, and general aspect of the case, are alike favourable to such a view.

An agricultural labourer, commonly employed out of doors, and thus exposed to all the influences which variations of season and weather are capable of exerting, living low, and working hard, need only be mentioned, to have their probable effects adequately appreciated; for morbid action once fairly lit up in the organ of hearing of such a patient, who is during

the same day heated and chilled, wet and dry, many times over, its only chance, in most cases, is to increase in intensity; for even if remedial measures were attempted, without at the same time shielding the sufferer from the dangers connected with his occupation, harm, rather than good, would be likely to ensue.

It seems fair to regard such a case as mainly arising out of the effects of chronic inflammation of the membrana tympani, and of the parts on both sides of this membrane; some of the characteristics of inflammatory action, it is true, have already passed away, but this does not lessen the correctness of the view, as far as the primary and main conditions are concerned.

If we could do all we wish in such a case, hygienic attentions, and well regulated diet, are not less required than are general and local remedies; for we can only hope to do good by a suitable combination of remedial agencies, the influences of which shall be kept up with the regulation or the modifications they may demand during a considerable time. Here, prognosis is, perhaps, more easy than diagnosis, and such prognosis must be regarded as

exceedingly unfavourable, for the great amount of disturbance in the function of the ear is undoubtedly associated with a corresponding amount of alteration in its structure, and when it is remembered that such structural alteration is the result of diseased action, which began so many years ago, it seems very improbable that any remedial agents, however combined and directed, will have the power of removing it altogether — to say nothing of the difficulty of lessening it in any degree appreciable or useful to the patient.

The state of things being noticed about a month after the above account was written, some little amendment seemed to have been effected; the condition of the throat had improved, and the patient stated that he was less deaf than before: during this time he had taken citrate of iron, and quinine, three times a day; a gargle was employed with one grain of nitrate of silver to the ounce of rose-water, and of the same fluid a small quantity was thrown into the guttural end of the Eustachian tube, night and morning; this was done with the aid of an elastic gum cathether, passed by way of the nostrils.

Opacity of the Membrana Tympani. Peculiar changes in Hearing.

November 15, 1854.—Mr. S., æt. 60, a healthy-looking man, has been deaf about seven years; the loss of audition was caused by a severe wetting, and sitting in wet clothes, outside a stage-coach. The tympanal membranes are slightly opaque, the Eustachian tubes pervious, and the mucous membrane of the pharynx healthy.

A remarkable peculiarity of the case is observed in the effects which changes of temperature produce on the hearing; for the patient says, “In a warm room I can hear nothing; but when I get out, and become cool, I can hear everything:” it should, however, be borne in mind that some patients with great nervous susceptibility are capable of receiving a great amount of impression from apparently unimportant causes. The patient, in this instance, is evidently a very susceptible individual; and the remarkable alterations in audition which he alludes to would require to be tested with instruments suited for taking an actual measure of the hearing distance, in the different atmospheric conditions just noticed, before they be permitted to weigh much in the balance of diagnosis.

Ceruminous Accumulation. Opacity of the Membrana Tympani.

November 17, 1854.—M. A. B., a female, æt. 31, has been inconvenienced by deafness during the last three months, which evidently depends mainly upon ceruminous accumulation. With the otoscope, and *through* the cerumen, the entry of air into the tympanum cannot be heard.

December 9.—The hearing is better, from partial clearing of the meatus on both sides, but even yet there is a reddened and irritated state of the lining membrane of the canal, with some remains of cerumen in its deeper part ; this is now easily taken away.

December 18.—By the application of a leech in front of each ear, with the aid of a little counter-irritation, produced by the rubbing on of nitrate of silver behind the auricle, the inflammatory affection of the lining of the meatus, and of the ceruminous glands, has been removed, and the deafness completely cured.

The meatus, on both sides, having been completely freed from all ceruminous accumulation, and its lining membrane having regained its natural appearance, the membrana tympani was found to have a perfectly

normal aspect on the right side, while, on the left, it wanted that peculiar and glistening hue which is characteristic of its healthy condition; and it may be well further to remark that, although the patient did not now consider herself deaf in the slightest degree, the hearing distance of the two sides was not equal—that on the right side having a longer range than the opposite.

In such cases, it not unfrequently happens that the delicate structure of the membrana tympani is altered by the deposit which takes place within it during the irritation caused by the presence of indurated cerumen, or of extraneous matter which may have entered by way of the external canals: if the membrane suffer on one side only, the deafness is probably not much felt, but if the two sides are in like morbid condition, the loss of audition may be very great.

Opacity of the Membrana Tympani.

December 14, 1854.—M. H., æt. 53, had an attack of rheumatism, twenty years ago, and has since had several returns of the same complaint. The

catamenia ceased five years ago. Three years ago she became deaf — living then “in a cold, smoky kitchen,” which compelled her to have the doors constantly open. During the last sixteen months she has kept a shop, with the door constantly open, and since this occupation was commenced her deafness has rapidly increased. The right ear is more deaf than the left ; and there is a corresponding difference in the aspect of the membrana tympani of the two sides—the right membrane being completely opaque—the left still retaining its normal and glistening appearance at the central part.

The tick of the watch is not heard on the right side, however closely it may be pressed upon the auricle ; on the left side it is heard when held half an inch from the auricle, but not at all when farther removed from the ear.

This case is very interesting, viewed in connection with some of the common sources of aural disease. The occupations of people in certain trades, and in certain kinds of shop-keeping, seem very inimical to the organ of hearing ; in other words, those who stand all day long attending to their business with open windows and doors are frequently found amongst

the sufferers from disease of the ear ; so that butchers, grocers, and others exposed to the influences of the atmosphere, more or less in the same way, as might easily be supposed, are of this class. Many thus employed, of course, escape, but amongst those who have anything of the serofulous condition, or who are predisposed to suffer from inflammatory action on the application of slight exciting causes, injuries to the ear, and to audition, are of common occurrence.

In this case the treatment recommended was the same as in some cases previously reported, and very particular directions were given to the patient respecting the importance of guarding the auditory apparatus as much as possible from injuries likely to be inflicted by cold. After the treatment had been continued during about a month, some little relief was obtained, the patient stating that her deafness was not as great as before, but, upon the whole, it seemed at this time that the prospect of further improvement was not very encouraging.

With regard to prognosis in such cases, it is of importance to observe carefully the condition of both ears ; for, in this instance, the state of the right membrana tympani would naturally suggest an unfavourable

prognosis; while the condition of the left would permit us to suppose that recovery of hearing might be attained if the patient were placed in circumstances likely to help this occurrence; and this latter observation tends to show how guarded and conditional such prognosis must be: difficulties of this kind in the sciences of observation we must always have, while in those of experiment and calculation, problems, or cases, can be more easily cleared of them.

Deafness after Scarlet Fever. Opacity of the Membrana Tympani.

October 18, 1853.—R. D., æt. 9, a delicate, fair-haired, and light-complexioned boy, had scarlet fever two years ago, and has been deaf ever since. The membrana tympani has lost its natural glistening surface, and presents a white and irregular aspect. Hears better with the right than with the left ear; and on the right side the meatus is wide, and more of the membrana tympani is seen than on the left. There is a slight enlargement of the left tonsil.

November 18.—The patient has taken the citrate of iron, and quinine; a solution of nitrate of silver

has been dropped into the ear ; and with this solution the enlarged tonsil and general surface of the pharynx have been repeatedly touched ; the wearing of flannel, warm stockings, and thick shoes, has been resorted to, and these means, with good diet, and early hours for rising and rest, have led to great improvement in hearing : the narrowed meatus has improved, from gradual thinning of its lining membrane. After the tonsil had been for some days treated with the caustic solution, the solid nitrate of silver was applied to its surface every other day during ten days, and this treatment was evidently an auxiliary in the relief of the patient.

As might be supposed, however, the hearing is not yet in normal condition ; for it seems fair to suppose that the parts most affected by the attack of scarlatina (in other words, the mucous membrane of the Eustachian tube, and tympanum,) have undergone alterations which tell upon audition more than do the morbid states which are subjected to ocular inspection, and which have been alluded to above. It may be added that the entrance of air to the tympanum is now more distinctly heard through the otoscope than it was before the treatment was commenced.

Deafness after Scarlet Fever. Opacity of the Membrana Tympani.

October 19, 1853.—S. P., a girl, æt. 9, had scarlet fever six years ago, and has been deaf ever since, without otorrhœa, but, for a time, with frequent ear-ache on the right side, from which she suffered most in the night; this ear-ache prevailed during the first four years of the deafness, but within the last two years it has not been felt. Hearing distance on both sides is about three inches.

Air entering the tympana is heard with the otoscope. The membrana tympani is opaque on both sides; red vessels are also seen near its margin; its surface has apparently lost the smoothness which characterises its normal condition, and from its appearance, it is probably thickened; it may, however, be observed that the thickness of a membrane placed in such a position cannot be determined in a very satisfactory manner by any of the usual modes of observation.

Chronic inflammation of the membrana tympani appears to have existed in this case, under the influence of which the morbid alterations occurred.

Blisters were applied behind the ears; after their

healing, the ointment of iodide of potassium was rubbed upon the surface night and morning during a month; and at the same time a weak solution of nitrate of silver was dropped once a day into the meatus; minute doses of iodide of potassium in the compound decoction of sarsaparilla being administered internally.

December 12.—The above treatment was followed by decided benefit to the hearing, as well as by marked improvement in the appearance of the membrana tympani.

Deafness after Fever. Opacity of the Membrana Tympani.

September 16, 1854.—M. N., æt. 28, a healthy-looking woman, is extremely, or what is sometimes called “shouting deaf”; this state followed an attack of fever from which she suffered about four and a half years ago. The membrana tympani is thickened and opaque on both sides. The Eustachian tube is pervious on both sides, and the pharynx and tonsils are in normal condition.

The extreme deafness can only be accounted for

on the supposition that deeper alterations in the tympanum, or labyrinth, or both, or in the nervous apparatus of audition, are amongst the morbid changes from which the patient suffers.

In cases of typhus I have had more than one opportunity of observing the vascular injection of the membrana tympani at a time when deafness prevailed. It is well known that an opinion prevails that deafness in fever "is a good sign": deafness, however, is a morbid condition, and is at all times bad; it may, nevertheless, be relatively good; in other words, it may be better than great intolerance of sound; but, in many cases of typhus in which deafness prevails, an injected state of the membrana tympani may be observed, and the application of leeches to the neighbourhood of the ear is often indicated.

In this case the period for leeching had evidently passed away, but the patient experienced some improvement in her hearing after blisters had been applied behind the ears, and kept open during three weeks.

Rheumatic Fever. Opacity of the Membrana Tympani.

September 5, 1853.—H. H., æt. 30, a healthy-looking lady, with dark hair, had rheumatic fever at seven years of age, and had two other attacks before the age of fourteen, and has had two more attacks of the same malady since she was grown up. On the right side the deafness is great, and here the membrana tympani is rough, thick-looking, and white. On the left side the deafness is less, and the morbid alteration of the membrana tympani, although of the same kind, is less in degree.

Miss H. says, "as a child, I suffered much from ear-ache : I have never been very quick of hearing, but within the last six months I have been much more deaf than before."

In this case it is probable that the tympanal membranes have not for some years been in a perfectly sound state ; their being opaque, and more or less thickened, may account for the fact that the hearing of the patient has never since she can remember been very acute.

The lining membrane of the external meatus was found to be dry, and void of cerumen on both sides,

although pale, or free from any appearance of vascular injection.

The deafness in this case seemed to depend on morbid alterations of several years' standing ; and which were not likely to be removed by therapeutic agents ; in such cases, it is of the utmost importance that patients should avoid all sources of additional disease, as it is one thing to be somewhat deaf, but another to be altogether incapable of hearing ordinary conversation.

Deafness after Parturition. Opacity of the Membrana Tympani.

November 22, 1853.—E. I., æt. 34, says that her second child was born five years ago, and that “severe flooding” came on two months after ; and that immediately after, and ever since this attack of uterine hæmorrhage, her hearing has been defective.

Leucorrhœa nearly always prevails ; the normal menstrual discharge occurs at the regular period, but is very limited in quantity ; and within the last six weeks, piles have been very troublesome, as they have often been on former occasions.

The external auditory canal is unusually wide, and straight, on both sides; the opaque tympanal membranes are easily seen on both sides; a small or central portion of the natural aspect being seen in the right membrane. Tinnitus is complained of; and the patient says that during the last week she has "kept fancying" that there were people in her house constantly making noises, and that she has asked others if they did not hear them. There are several bad teeth, both in front and at the back, and carious portions of the dental apparatus from time to time come away.

November 24.—The ears have been carefully syringed, and since the membrana tympani was thus cleared, a little oil dropped into the ears, and a stomachic aperient given, the tinnitus has vanished, and the patient says that for many weeks she has not passed so comfortable a day as she did yesterday.

November 28.—Complains of great tenderness in the face, which appears to be the result of exposure to damp and cold, with the help which her diseased teeth give to such an occurrence.

December 6.—One front upper incisor, and one left side and lower molar tooth have broken off since

the last date. It need scarcely be remarked that conditions of the dental arches, such as prevail in this instance, are well worthy of the attention of the practitioner, and that they increase in importance as they approach nearer to the hinder parts of the jaw.

Deafness after Parturition, Opacity of the Membrana Tympani.

November 30, 1853.—Ann H., æt. 41, became deaf about six weeks after a confinement, now thirteen years ago; she has had thirteen children, of which three are living; it was after the birth of the second child that the deafness occurred.

This is one of an important class of cases of deafness; partial, or even great loss of hearing after child-birth, is so common, that we cannot fail to see the necessity of attending closely to its earliest symptoms, at a time when incipient myringitis would often be relieved by well directed local and general treatment.

There is little doubt that leeches, applied in front of the ear, with blisters on the mastoid process, and a little calomel and opium, after the administration

of aperients, along with suitable diet and hygienic attentions, would often prevent that thickening and opacity of the membrana tympani which is met with in cases of this kind, and which is strongly marked in this particular instance.

Deafness after Parturition. Opacity of the Membrana Tympani.

July 11, 1854.—E. B., æt. 50, has had ten children, and became deaf after her third confinement; she says, “When I began to go about I found that my head was benumbed, and that I had lost my hearing; and the deafness has got worse ever since.”

The patient further states that after her last four confinements, in other words, after each, her sight has become worse; she, however, reads tolerably well with a slightly convex lens.

There has not been any otorrhœa on either side; the membrana tympani is opaque on both sides, but the deafness seems to depend, in some measure, on an affection of the labyrinth, or of parts within the cranium which are beyond the reach of any known remedial agent.

In cases of this kind, it is of the utmost importance to determine, as nearly as may be, the condition of the Eustachian tube, and that of the cavity of the tympanum, before deciding that the affection in any great measure belongs to the labyrinth, or more internal parts of the ear.

Deafness after Parturition. Opacity of the Membrana Tympani.

July 14, 1854.—M. M'C., æt. 32, has been married thirteen years, and has had eight children; she became “hard of hearing” after a confinement, about nine years ago, and the deafness increased from the effect of cold, as she thinks, about seven years ago.

The membrana tympani is opaque on both sides. The patient hears the tick of a watch when closely pressed against the ear on either side, but it is inaudible, on either side, at the distance of one inch. The affection seems to have told upon the membrana tympani, the cavitas tympani, and the Eustachian tube, and probably also upon the delicate apparatus of the labyrinth. With the otoscope the entrance of air into the tympanum is not heard.

Menstruation has always been very limited in quantity. At the time when the deafness was first observed, the patient was "confined of an eight months' still-born child," after flooding for a week previously.

In this case good diet was recommended, and tonics were used; warm clothing, and the avoiding of all exposure to cold, being amongst the hygienic directions most insisted on; but the patient was not found to receive any benefit from the stomachic aperients, the alteratives, the counter-irritation, the galvanism, or the catheterism of the Eustachian tube, which were employed.

Extreme deafness now and then follows attacks of uterine haemorrhage, the acoustic nerve seeming, if we may so express it, to have more than its share of the injury sustained by the nervous system in general. If such deafness has already existed very long, and without improvement, the prognosis must be very unfavourable.

• Deafness after Parturition.

October 20, 1854.—J. T., æt. 40, a married woman, of dark complexion, was confined about eight months ago, and has ever since been deaf. The

parturition occurred one very cold day in February, and the patient says that she "got cold" the very same day, and on the third day after she was very deaf. The watch, closely pressed upon the auricle, is not heard on the left side, and but very faintly on the right. With the otoscope the air is not heard to enter the tympanum on either side. The membrana tympani is opaque on both sides; on the left side its surface appears rough, and the neighbouring part of the meatus is very much narrowed by alteration of its lining membrane.

Leeches were applied in front of the ears, the nitrate of silver was rubbed upon the integument behind each ear every third day, for about half a dozen times, chalybeate tonics were administered, and the patient being feeble, she was recommended, as soon as convenient, to wean the strong child she was suckling.

One month after the commencement of the treatment her strength and general health had improved, and the deafness was less complained of than before, although not entirely removed.

The nitrate of silver solution was next dropped into the ears twice a day, and in about fourteen days

there was a marked improvement in the aspect of the membrana tympani on both sides; while the narrowing of the meatus on the left side was favourably influenced by the same remedy; the calibre of the tube gradually increasing as its lining membrane became thinner. The deafness, however, still exists, although much less than before.

The Eustachian catheter was next used, and the tympanum inflated on the right side, immediately after which the patient was surprised at the improvement in her hearing; on the left side, air, sent along the catheter, could not be heard to reach the tympanum.

Deafness after Parturition. Opacity of the Membrana Tympani.

November 18, 1854.—M. J., æt. 24, never suffered from any head or aural complaint until the time of the birth of her daughter, about fourteen months ago. A fortnight after the parturition, head-ache came on, and fourteen days later she was attacked by ear-ache, as she believes, from exposure to cold; the pain in a few days ceased, but deafness followed. Tinnitus, in the left ear, is compared to "a buzzing," which is accompanied by pain.

The tympana are easily inflated ; the membrana tympani on both sides slightly opaque. Bad teeth are found on both sides of the lower jaw. Both the head and aural symptoms are increased when the patient lies down, the suffering, as it would seem, being heightened by the more easy charging of the cerebral vessels, which is favoured by the horizontal position. The mucous membrane of the pharynx is found to be in an unhealthy state, thickened, and redder than natural.

Leeches were applied in front of the ear, an astringent gargle employed, and a course of chalybeate tonics prescribed. After a fortnight, blisters were applied behind the ears, and kept open during ten days. This treatment proved beneficial ; the tinnitus gradually became less troublesome, and in about three weeks after its commencement the patient was happy enough to pass whole days “ without feeling any noise in the ears, and with considerable improvement in the hearing.”

The circumstances attending parturition are such as lead, not unfrequently, to diseases in the organs of sense, particularly of the eye or ear ; these affections are often of a serious nature, more especially in cases where the deafness, or blindness, depends upon affections

of the nervous centres, or of the nervous system of the eye or ear, which may have followed some of the accidents of parturition ; such as extreme loss of blood, exhaustion from difficult or protracted labour, convulsions, &c., to say nothing of the occurrence of head affections, or of the injury occasionally done at a later period, by lactation, too long continued.

In another class of diseases of these important organs of sense, the injury done commences with inflammation of the mucous membranes, and, as far as the ear is concerned, this is perhaps the most frequent form of malady occurring under the circumstances in question ; a female, lately confined, and stoved, as often happens, in a very warm apartment, loses, if we may be allowed the expression, all recollection of the ordinary temperature of the atmosphere, and after remaining nine days (or any other mystic and odd number of days, in which some people have such faith,) in her heated room, all at once leaves it, to move in an atmosphere perhaps fifteen or twenty degrees lower in temperature, just as the Chinese change their dress on a certain day of the year, irrespective of the wind that blows, or of the weather that may prevail.

One consequence of this proceeding, which surgeons every now and then are called upon to notice, is an attack of deafness, not unfrequently accompanied with tinnitus, occasionally with sore throat, and partial closure of the Eustachian tubes, often with opacity of the membrana tympani, and in some instances, although these are not common, with otorrhœa.

Tinnitus. Opacity of the Membrana Tympani.

October 19, 1853.—E. F., a female, æt. 50, has been deaf on the right side from childhood; at an early period of life she suffered much from tooth-ache on the right side, in the lower molar teeth, and on this account wore flannel upon the right side of her face, which was not carefully attended to—sometimes worn, at others thrown off—and from this incautious practice, as the patient's mother believed, the right side hearing was lost, without the occurrence of any pain in the head or ear.

On the right side *total* deafness prevails; on the left the ticking of a watch is heard at the distance of one inch. The tympanum is completely inflated

on both sides. Tinnitus is complained of as affecting chiefly the right side, but the left ear is not altogether free from it; the cataractous "rushing of water from rock to rock, the turning of a wheel, and the sound of a fiddle," are mentioned by the patient, as sounds to which she likens what she experiences in her ears. The right membrana tympani has a dull white appearance, and is probably much thickened. A slight cold is sufficient to produce an extreme state of deafness.

Chronic inflammation, producing thickening and opacity of the membrana tympani, is not always attended with pain; it is, however, always attended with deafness, and often with tinnitus.

The patient is the mother of five children — the last born fourteen years ago: the catamenia ceased three months ago, and a degeneration of the os, and cervix uteri, of a cauliflower excrescence character, is now progressing. After the cessation of the menses the deafness considerably increased.

Here it is worthy of remark that the cessation of the menses is not unfrequently followed by diminished perception of light or sound, rarely by diminished perception of both; the same consequences now and

then follow the cessation of the haemorrhoidal discharge in men ; in women this latter occurrence is more rare.

In this case a seton was passed into the back of the neck, and after the discharge from it had been kept up during a month, the patient considered her hearing to be improved ; the amendment, however, was not in extreme degree. The seton in the neck was deemed allowable, although, in females, generally, there are obvious objections to its employment.

Tinnitus. Opacity of the Membrana Tympani.

December 10, 1853.—M. B., æt. 45, a healthy-looking labourer, says that about two years ago he began to suffer from noise in the right ear, which he thought “was brought on by exposure to the weather” when heated by hard labour ; the tinnitus gradually left him, after prevailing during two months ; the recovery, as it would seem, was not influenced by the action of any remedial agent.

About seven months ago, the tinnitus, in the same, or right ear, returned, and has ever since remained, unaffected by any treatment which has been resorted to ; of which repeated blisters to the nape of the neck, as well as to the right mastoid process, have formed a part.

The tympanum, on both sides, is freely inflated, as heard by the otoscope. The right membrana tympani is whiter and more pearly than the left, which retains more of its normal aspect.

A seton was passed into the nape of the neck, and compound decoction of sarsaparilla, with iodide of potassium, ordered.

December 24.—Some little improvement, with regard to tinnitus, has taken place ; the patient says that for months he has not been so free from it as he is to-day.

In this case the vapour of chloroform was passed into the tympanum, on both sides, through the Eustachian catheter, previously introduced, and in the course of an hour after its employment the effect produced seemed to be favourable, the tinnitus being less felt than before.

An instrument invented by M. Matthieu, surgical instrument maker, in Paris, is well suited for the employment of the vapour of chloroform in cases of this kind ; it consists of an Indian-rubber bottle, with a valve for the admission of air in the centre of its base, or broadest part ; the metallic nozzle is small enough to pass into the extremity of the Eustachian catheter at its extreme point, but, between this and the Indian-rubber bottle there is a wider part, or short

chamber, into which the chloroform may be poured, through a small aperture closed by a sort of cap, which is screwed off and replaced at pleasure. The cylinder being supplied with a little chloroform, atmospheric air blown through the apparatus, by compression of the elastic bottle, carries a sufficient charge of the chloroform vapour along with it, which passes through the catheter into the Eustachian tube and tympanum.

Tinnitus. Opacity of the Membrana Tympani.

June 23, 1854.—M. C. C., a female, æt. 26, has suffered from tinnitus during the last month, in connection with which the only morbid alteration to be observed is a state of opacity, and a want of the bright or glistening condition of the membrana tympani on both sides.

Blisters were applied behind the ears, and a little olive oil was dropped twice a day into the meatus; the patient took two or three doses of blue pill, with infusion of gentian and sulphate of magnesia, and the noise in the ears gradually ceased, and this without any remarkable alteration in the appearance of the membrana tympani.

Tinnitus. Opacity of the Membrana Tympani.

August 21, 1854.—S. S., æt. 65, has been deaf during the last eighteen months; he says, “I got wet through, and went deaf soon afterwards.” The tympanal membranes are slightly opaque; and the tympanum is not fully inflated from the throat on either side. Tinnitus is much complained of.

The nitrate of silver was rubbed behind the ears, a seton passed into the nape of the neck, glycerine ordered to be dropped into the ears, and aperient medicine prescribed.

October 2.—The hearing has improved; the tinnitus still prevails.

This patient states that as soon as he gets warm by the fireside, he becomes more deaf, but that the partially lost hearing is regained when he goes out into the cold air; he is not the subject of that peculiar nervous susceptibility alluded to in connection with a case previously reported.

October 10.—Catheterism and inflation of the Eustachian tubes have been followed by cessation of the tinnitus.

Tinnitus. Opacity of the Membrana Tympani.

August 21, 1854.—P. B., a gentleman, æt. 29, complains of noise in the ears, which first occurred about a month ago, and has been felt daily ever since. An opaque state of the tympanal membrane is observed on both sides.

Exposure to cold seems to have led to the production of the present morbid conditions: the patient has been much in the habit of throwing the windows of his warehouse wide open when in profuse perspiration after very active exercise. Deafness is not complained of.

This patient was recommended to avoid further injury from cold. Leeches in front, blisters behind the ears, with aperients, and a fortnight's rest, were found sufficient to remove the chronic irritation within the tympanum, and along with it the tinnitus.

Cases more or less of this nature are not unfrequently met with in practice; the aural suffering is often alluded to by patients as commencing after sitting near to the door, or with the ear exposed to a draught of cold air, coming in at a door or window, &c., the body generally being, perhaps, very warm at the time, but still and quiet, as in the case of

clerks in the offices of merchants, of school-boys on the form, or of Catholic clergymen in the confessional box.

On examining the external ear with the speculum, we often find the deeper part of the meatus narrowed by thickening of its lining membrane, at the same time intensely red, and in great measure hiding the membrana tympani from view; such a state of parts commonly prevails on one side only, and as it is not always attended by any considerable pain, it now and then happens that it is neglected by the patient until an accidental accumulation of cerumen in the opposite ear leads to deafness on the better side, and then only the patient begins to find himself seriously inconvenienced.

Ossification of the Membrana Tympani.

November 28, 1855.—Mr. A., a gentleman of 65, is extremely deaf; it is requisite to shout into his ear, to enable him to hear what is said; his deafness, which is of fifteen years' standing, has increased much within the last two years. On examination with the

otoscope, it is found that the Eustachian tube is impervious on the right side, and the entrance of air to the tympanum is but faintly heard on the left.

There is a white patch of ossific deposit on the right membrana tympani; it occupies nearly the whole of the upper half of the membrane; touched with the probe, it is rough, and unyielding, but although the end of the instrument was applied to it in a very careful manner, the patient experienced a painful sensation from its application.

This gentleman has had several attacks of gout, in connection with which the affection of the membrana tympani requires to be considered.

The deafness is much the same in degree on both sides, although the left membrana tympani does not display any remarkable feature of morbid change, if we except a state of opacity, seen at its circumference; this gives an opaque rim to the membrane—a sort of *arcus senilis* of the ear. Viewing the morbid conditions already alluded to in connection with the age and constitution of the patient, we see good reason for supposing that other important changes may have taken place in the organ of hearing, but which are out of the reach of physical diagnosis, and the nature,

or extent, of which cannot be satisfactorily unveiled by any other mode of inquiry.

The results obtained by the employment of the tuning-fork tend to show that the true seat of hearing is less affected than the accessory or tympanic part of the auditory apparatus. The prognosis is evidently of an unfavourable kind, inasmuch as the morbid condition of the membrana tympani is more likely to be increased by the influence of the gouty diathesis, than lessened by the action of remedies.

It was thought well not to recommend the adoption of any surgical treatment, lest by irritation, which catheterism of the Eustachian tube might possibly produce, in a sensitive and irritable patient, some addition might be made to the morbid state already prevailing. Perforation of the membrana tympani did not appear to be indicated.

Opacity of the Membrana Tympani. Stomach affection.

Deafness.

Mr. H., æt. 52, has lately become deaf on the right side, where the membrana tympani is found to be opaque; the patient formerly enjoyed very good

health, but, during the last two years, has been troubled with dyspeptic symptoms, attended by frequent attacks of a very troublesome urticaria, so that the question is suggested, as to whether or no this affection of the membrana tympani has commenced in its lining, or mucous membrane, by virtue of those conditions of sympathy which tell so often on parts of the mucous membranes widely separated from each other.

Deaf people often complain of being more deaf when the stomach is out of order; and those who suffer from impaired vision not unfrequently see worse than usual from the same cause; but the stomach regaining its normal condition, hearing or vision improves; if, however, the gastric derangement be often repeated, and this for years, and if, at the same time, we have morbid alterations of the cutaneous surface, it is readily supposed that the lining of the tympanum may sympathise with such a state, as the lining of the nose is known to do with the gastric derangements of children; and it may be added, that continued disturbance of the nervous system of a part so finely organised as the tympanum may help the occurrence of organic change in a delicate texture like that of the membrana tympani.

It should also be borne in mind that deafness, in such a case, may not depend altogether on the morbid state of the membrana tympani; it may be produced, in part, by that disturbance in the nervous system of the ear which is supposed, in some measure, at least, to precede the occurrence of any visible organic change; of such an occurrence we have an *analogue*, as far as the eye is concerned, in those alterations of the pupil chiefly seen in its wide dilatation, which are not unfrequently met with in children suffering from worms in the intestines, and which seem to depend on changes in the sensibility of the retina, produced by the disturbed state of a distant part.

In this case, an emetic was recommended, to be followed by a few doses of blue pill, with gentian and Epsom salts; the nitrate of silver was rubbed upon the mastoid process, and a weak solution of it dropped once a day into the external meatus of the affected side; the results of this treatment have yet to be waited for.

It is worthy of notice that the cutaneous eruption above alluded to affected the right side of the face, more especially in the vicinity of the labial commissure, in an extreme degree, so that the lips, but more especially the upper, were now and then considerably swollen.

SECTION IV.

Otorrhœa.

THE nomenclature employed by nosologists is far from being perfect, while the inconveniences which would arise out of frequent alterations in the names of diseases are great enough to retard even desirable changes. The names applied to some diseases were given to them when the diseases themselves had been but little studied, and were very imperfectly known ; and hence it happened that, in some cases, the name of a very obvious and characteristic symptom came to be adopted as the name of the disease itself, although it carried with it literally no idea or suggestion relating to the nature of the morbid changes which the parts most affected had undergone, or from which they were suffering ; that such remarks apply to the word *otorrhœa* requires no comment, and that they are equally applicable to the term *deafness* need not be mentioned.

Every discharge from the ear, which has been of long continuance, should be regarded as a symptom which betrays the existence of a disease often thought unimportant, but which may be of a very serious nature, inasmuch as deafness and dumbness, paralysis, imbecility, insanity, pyemia, hæmorrhage, and even death, are amongst the possible associations and consequences of maladies to which the name otorrhœa has been given; hence, it is obvious that complaints of this nature should be thoroughly investigated at the earliest convenient period, and that no effort of rational inquiry, or physical diagnosis, should be spared in making out the general history and mode of origin, the nature, progress, tendencies, and complications of every malady of this kind, that the means of cure may be determined, and the mode of preventing a recurrence of the disease suggested before the parts affected by the morbid action shall have sustained irreparable injury. By way of using a strong expression, it may be said, that this question of time is everything in the diagnosis, prognosis, and treatment of otorrhœa; one day the disease may, in some cases, be confined to the external meatus, on the next, it may destroy the membrana tympani, afterwards to ravage the drum of

the ear, if not the incomparably delicate mechanism hidden in the neighbouring labyrinth, thus endangering the brain by damaging the osseous case which contains it. By arresting such a malady before it reaches the deeper parts of the ear, the loss of hearing and of speech is often, and the loss of life occasionally prevented. So long as the aural discharge is allowed to continue, there is no knowing what it may lead to, or what the extent of injury which may be inflicted upon the parts affected by the morbid action which is going on, and hence the necessity of arresting the disease which gives rise to the otorrhœa by the employment of the treatment which seems to be indicated, at the earliest convenient period.

It has been thought unsafe to cure otorrhœa, lest by stopping the aural discharge some cerebral or other serious disease should be started into existence; it appears, however, quite as rational to cure otorrhœa as it is to cure gonorrhœa, and the persistence of the latter has never been thought desirable, although it occasionally happens that its disappearance is followed by the occurrence of swelled testicle. To stop a gonorrhœa, or otorrhœa, suddenly, by the employment of strong astringents, or other potent agents, is one

thing, but to treat either disease with the aid of antiphlogistic, soothing, or other rational means, is another, both in its nature and consequences.

In the observation of cases of otorrhœa it is important, in the first place, to determine whether the discharge which appears externally is produced altogether within the external meatus; so that, if possible, we should obtain a good view of the membrana tympani; for, if the membrane be found entire, and without any perforation, we at once conclude that the aural discharge does not flow from the tympanum. If perforation of the membrana tympani exist, so as to open a free communication between the tympanum and the external meatus, then, in all probability, the discharge will be supplied more or less by the lining membrane of the tympanic cavity. It is, in the next place, very desirable to determine how much of the membrana tympani has been lost, and whether any part of the chain of ossicula has been separated by the diseased action. When the small bones of the tympanum come away through the external meatus they commonly attract attention, and their white colour is often remembered, even when their form has not been borne in mind by the patient or his friends.

In cases where the temporal bone is diseased, carious portions may escape by way of the external canal ; their exit is now and then assisted by the fingers of the patient, or by those of friends around him ; such carious portions differ very much in appearance from the genuine ossicula auditus ; they are black, or of a dirty-looking grey colour, and often accompanied on their arrival by very foetid discharge ; the ossicula auditus are seldom affected by anything like genuine caries, their connections are too fragile to resist long the influences of any serious morbid action, so that these connections are commonly broken up before the structure of any of the ossicula is much affected. In examining cases of otorrhœa, it is satisfactory to find that the affection is confined to the external canal ; if the membrana tympani be perforated without much loss of its substance, it is a source of encouragement to have reason to think that the ossicula are *in situ* ; this may be in some measure determined if the membrana tympani be not opaque, but if this membrane have lost the degree of transparency which naturally belongs to it, the malleus is no longer visible through its texture, so that, the outer end of the ossicula being out of sight,

we are deprived, in some measure, of the aid of physical diagnosis in this part of the inquiry. If any great portion of the membrana tympani be lost, a part of the malleus, or the whole of this bone, with or without other portions of the chain of ossicula, may also have come away, and, in such cases, the view, if the tympanum be empty, reaches the promontory, instead of being interrupted by the membrana tympani, as in the normal state of the parts.

Next comes the question as to what is the state of the interior of the tympanum, in connection with which the mucous membrane, the periosteum, the bone, the chorda tympani nerve, and the tympanic plexus, are amongst important matters which require consideration.

In cases where the membrana tympani has been lost, we may find the interior of the drum lined, if not filled, by fleshy granulations; these not unfrequently sprout into the meatus, and occasionally render it difficult to determine whether or no the membrana tympani be present, inasmuch as such granulations might possibly arise at the bottom of the meatus, the membrana tympani, as yet, being entire. In most cases, however, we can pass a suitably bent probe by the side of the granulations, or between these and

the wall of the meatus, and thus reach beyond the part of the fleshy growth which projects into the external canal, so as to feel the interior of the tympanum, where the sensation obtained with the end of the probe will depend, in great measure, on the more or less healthy, or diseased state, of the mucous membrane of the drum. Granulations, or fleshy growths, such as are here alluded to, differ much from true polypus, with which they should not be confounded. If the membrana tympani be lost, and the tympanic cavity free from morbid growth, the morbid conditions should be noticed with the aid of the speculum, the probe, and the otoscope; the characteristic sensation which is imparted to a steel probe passed through the meatus into the tympanum and striking upon the promontory at its inner side cannot be easily mistaken.

It should be borne in mind that, in some cases, the probe will strike upon bone covered by its periosteum, and not yet seriously diseased; but that in others, bone, deprived of its periosteum, and suffering from caries or necrosis, may be felt, and that the sensations imparted by these different states should always be carefully distinguished.

Here let it be remarked that the examination of the interior of the tympanum with the aid of the probe is by no means void of danger, and at all times requires to be done with the utmost delicacy of touch. To injure the chorda tympani nerve, and thus cause paralysis of the face, would be a serious accident; to lacerate any small blood vessel, so as to give rise to haemorrhage, which might leave clots upon the membrane of the fenestra ovalis, or fenestra rotunda, might make a deaf person much deafer; to damage in any way the ossicula, or their remains, might have the same effect; and here one fact relating to the stapes is particularly worthy of notice, and this fact may be stated as follows:—When the chain of ossicula is broken, this breaking often occurs at the neck of the stapes—this small, and important bone, keeping its position, and remaining as before, fixed, in connection with the membrane of the fenestra ovalis, while the malleus and incus, to say nothing of the os orbiculare, come away; in such a state of parts, a considerable amount of audition may yet be enjoyed, but, if the surgeon, in making a curious and pains-taking examination, were to direct his probe towards the upper part of the promontory, it

might there strike upon the slightly projecting neck of the stapes, the bony feel of which might tempt to a little further use of the probe, by way of ascertaining with precision the nature of the surface touched upon, when the accidental breaking off of the stapes, and, possibly, at the same time, the injury of the membrane of the *fenestra ovalis*, might produce at once a complete and incurable deafness.

If the term *otorrhœa* be applied, as, by some, it would seem to have been, to all cases of aural disease attended by discharge from the external meatus, it must then include a very considerable portion of the maladies which attack the auditory apparatus, whether commencing in the ear itself, or extending to it from any part of the cutaneous surface without, or the mucous membrane within; and hence it is easily understood that the complaints so grouped together would present many and great varieties of disease, from the simplest and least important forms of aural discharge, such as are frequently met with in young children, to the most serious types of ear affection, such, for instance, as total destruction of the acoustic apparatus of the tympanum, with discharge of the ossicula, and even caries of the temporal bone,

damaging the most essential parts of the auditory mechanism, and thus destroying the hearing, and but too often threatening, or even destroying, life.

For the purpose of showing how very important, and how very interesting, many cases of disease of the ear attended by discharge from the external meatus really are, the cases of otorrhœa which follow may be headed by a few instances of aural discharge, connected with perforation, and, in some cases, with loss of the membrana tympani ; such alterations of this membrane having, in most cases, followed on tubercular disease of the structures within the tympanum, or on catarrhal or purulent collections occurring in this cavity. In such cases the aperture in the membrana tympani may remain open, (which frequently occurs,) or it may become closed, an event which is comparatively rare ; and here it may be remarked that the word closed is advisedly employed, inasmuch as the aperture of the membrane very rarely heals by adhesion, granulation, or any form of what we may call vital soldering of its edges, so as to leave the membrane in a free state, and as well fitted for its function of vibration as before ; instead of this, it will often be found fixed by abnormal adhesions, or

altered in its condition by new products, results of the morbid action, or of the reparative process.

It is worthy of notice that an apparent closure of the opening in the membrana tympani may sometimes be deceptive; on one day the patient easily blows air through the Eustachian tube and tympanum, to the exterior; on the next he may not be able to do so, but, on this account, it is not to be supposed that the perforation has been closed by the healing process, inasmuch as it often happens that some of the morbid products, in an inspissated, or dried state, on one or both sides of the tympanal membrane, may prevent the passage of the air, to say nothing of obstruction in the Eustachian tube and tympanum, more or less away from the perforation in question.

Otorrhœa. Perforation of Left Membrana Tympani.

November 25, 1855.—J. V., æt. 26, a ship painter, has been deaf during the last two years; on the left side he does not hear the tick of the watch pressed closely upon the auricle, on the right side he can hear the tick when the watch is held an

inch from the auricle, but not at a greater distance ; there is a constant "ringing" in the left ear, and a constant "buzzing" in the right ; both these have troubled him from the commencement of the deafness, or during the last two years. The patient says—"the first thing I felt amiss was a sudden ring, in my left ear, one morning when I was going down to work."

It is worthy of notice that the patient made no mention of any subsequent otorrhœa, but on inquiry it was found that left side otorrhœa followed immediately on the attack of ringing in the left ear, and continued during a fortnight, and then ceased ; the hearing was better during the progress of the otorrhœa than it was after the discharge disappeared.

The left membrana tympani is of a deep red colour, looking generally quite smooth, or without any rough or granular aspect ; at a point corresponding to the middle of the membrane there is a slight modification of the surface, as if, just at this point, the general smoothness had been in some way disturbed ; and here the membrane is found to be perforated, so that air forced through the Eustachian tube whistles through the middle of the membrana tympani by way of an

aperture which the end of a probe would apparently cover, and which would not be discovered by the eye if the other means of physical diagnosis were not employed.

This is one of those cases, often met with in practice, where the almost total loss of hearing on one side is unheeded, until some deafness occurs on the other side also, when the patient is compelled to seek relief for his loss of audition.

The right meatus was found to be completely plugged by a dark-coloured ceruminous mass ; this being removed, the hearing of the patient, on the right side, was restored.

The above remarks respecting the perforation of the membrana tympani on the left side were the result of an examination made in the dry state of the parts ; afterwards a little milk was poured into the bottom of the meatus, and the patient directed to blow through the Eustachian tube and tympanum, as before ; the air thus expelled came bubbling through the milk, but, in such a way as might have given rise to the supposition that the aperture in the membrana tympani was much greater than it really is : and this is readily understood, for the air, pressed

through the small aperture in question, immediately spreads its influence in the fluid which it traverses at the bottom of the meatus, so that the effect produced might be illustrated by saying that the air passing through the milk used in this case, or through any muco-purulent discharge, in a similar position, may be imagined to be represented by a cone, the apex of which corresponds to the aperture in the membrana tympani—the base, to that bubbling surface on the exterior of the fluid which is noticed by the eye of the observer; so that while the real aperture in the membrana tympani is out of sight, we must not be deceived as to its size by the larger opening through the fluid at the bottom of the meatus which the air in its transit seems to make.

Several cases of otorrhœa, illustrating this remark, have come under my notice, in which a considerable quantity of muco-purulent fluid was found in the depth of the meatus externus, and through which the air from the Eustachian tube was driven, and in such manner as to give rise, at first sight, to the supposition that the membrana tympani was in great measure removed by ulceration, when, in reality, there was but a very small aperture in its disc.

November 30.—The appearance of the membrana tympani on the left side has already improved, from the instillation of a weak solution of nitrate of silver, and the patient can now hear the tick of the watch held close to his ear on this side.

December 9.—The further improvement of the hearing on the same side is remarkable; to-day it is found that the watch may be held at the distance of a hand-breadth from the ear, and yet its tick remains audible. It is also worthy of remark that this hearing, at the distance of a hand-breadth, if so we may express it, was artificially brought about; for, on examining the membrana tympani with the aid of the speculum, and a good light, it was found to be coated with a white pellicle, produced apparently by discharge, of which the more volatile parts had evaporated; this pellicle was carefully removed, immediately after which it was found that the hearing distance for the tick of the watch was increased by more than two inches.

In this case the hearing was not improved by the application of cotton or other substance to, or near to, the aperture in the membrana tympani.

Otorrhœa. Perforation of the Membrana Tympani on both sides.

November 22, 1855.—James C., æt. 18, a tall, healthy-looking young man, says that he has been very deaf during the last seven days, and that this deafness followed a bad cold from which he suffered during the previous week. The attack of cold began with a severe pain in the right ear, which compelled the patient to leave his occupation as waiter in a supper-room, and thus seek relief in rest, at home; there was considerable catarrhal discharge from the nose, and sore throat at the same time. The patient felt no pain or inconvenience in the left ear at the time he suffered so much from the right.

The membrana tympani is perforated by ulceration at the lower part, on both sides, and air is easily blown from the Eustachian tube, and through the tympanum and external meatus. The air thus forced through the tympanum agitates in its passage a considerable quantity of muco-purulent matter, which can be seen to bubble in the bottom of the meatus on both sides.

About a month before the occurrence of this ear affection the patient suffered considerably from frequent

attacks of epistaxis, and the Schneiderian membrane is at present tumid and intensely red.

November 28.—During the last week the bottom of the meatus has been carefully cleared three times a day, and a solution of nitrate of silver dropped in immediately after the surfaces were prepared to receive it. The opening in the membrana tympani is now closed on the right side, the part looking rough and irregular, with no well seen piece of the normal membrane remaining; on this side the Eustachian tube is free, and the normal hearing is completely restored, the tick of the watch being heard at arm's length from the ear; while, on the left side, the hearing distance for the tick of the watch is only eight inches; this is accounted for by the state of the membrana tympani, in which there is a well defined and rounded aperture, through which the patient can easily blow air, by way of the Eustachian tube, to the exterior.

This case has some remarkable features; its rapid progress to perforation of the membrana tympani is worthy of notice, while the closure of the abnormal aperture on one side, and the comparatively good hearing regained in both, are equally curious and important.

Loss of the Membrana Tympani. Exposure of the Promontory.
Occasional Otorrhœa.

One of the very remarkable features that sometimes characterise cases of loss of the membrana tympani, in which otorrhœa is met with, or where it has formerly prevailed, is, the naked condition of the bony "promontory" on the inner wall of the tympanum; the delicate mucous membrane, which, in the normal state, covers this part, appears, in some cases, to lose all traces of moisture—presenting a completely dry surface, which can be seen with the aid of the speculum, and upon which the probe is easily struck, and this stroke, or touch, instead of producing that shock which is felt by the patient when the membrana tympani is approached, causes no particular uneasiness in some cases already of long standing, where the sensitiveness associated with inflammatory action has passed away. It is, perhaps, in part owing to the peculiar hardness of the osseous structure on the exterior of the petrous bone, that such a state of exposure as that alluded to above may continue for many years, without leading to caries or necrosis of the part affected: it is not easy to call to mind any other instance in which the true

bony structure remains with impunity in this state of comparative exposure during even a great part of life.

An aged gentleman, of 75, who has occasionally been under my care for chest affection, has the promontory in the left tympanum in the state above described ; the meatus is wide, there is no trace of the membrana tympani remaining, and the promontory can be seen, and also touched with the probe ; air cannot be expelled from the throat to the external meatus, so that there is probably a closed state of the narrowed, bony, or tympanal part of the Eustachian tube. The external meatus is commonly dry, but now and then a muco-purulent discharge issues from it ; this occurrence of occasional ottorrhœa is commonly preceded by head-ache, with a feeling of heaviness, and pain in the ear : on the side thus affected the patient is extremely deaf.

In a lady of 65, now under my care, who suffers also from extreme deafness, the left ear is in a condition very closely resembling that just described ; the membrana tympani has been entirely removed, and the ossicula auditus lost ; the promontory can be seen with the aid of the speculum, and betrays very little sensibility when touched with the probe ; the Eustachian tube

is pervious, and the ear has "for some years" been in a dry state, although otorrhœa formerly prevailed. In the right ear the membrana tympani presents its normal aspect at the bottom of the healthy meatus, and the Eustachian tube is pervious, but, nevertheless, even on this side the deafness is extreme, so that loud shouting is required to make the patient hear; she says that her deafness is of fifteen years' standing, and that originally it was produced by cold.

In such cases as these, where there is no part of the natural membrana tympani remaining, it is rarely found that any foreign body passed into the meatus acts as a substitute for it, so as to benefit the hearing. On the introduction of such a substance, whether in the shape of a morsel of cotton-wool, or a disc of leather, caoutchouc, gutta percha, or other flexible material, the patient, if not too deaf to make the distinction, often finds that the loss of hearing is increased, instead of being diminished.

The two cases just noticed were regarded originally as cases of otorrhœa; the first—that of the gentleman—occurred at the age of seventeen, and was attributed to the fact of having carried a heavy basket of apples on the head, on a day of fruit-

gathering in autumn; the discharge from the ear which seems to have been associated with inflammation of the parts within the meatus and tympanum was uninterrupted for some months, but afterwards disappeared, to recur from time to time with irregular intervals. The other ear was not affected, and hence the loss of audition is comparatively little complained of. In the case of the lady attacked at the age of fifty, both ears suffered, and hence the deafness was much more felt.

It is worthy of remark that, in many cases of this kind, where both ears ultimately suffer, the attack commenced at first on one side only, and this remark, alone, is sufficient to show the importance of very early treatment in such instances, by which one ear often, and both not unfrequently, would be saved.

Otorrhœa. Pulsation affecting the Margin of the Aperture in the Membrana Tympani. Pulsation of Air Bubble in the Aperture.

In some cases of ulceration of the membrana tympani, the blood-vessels of the tympanum being probably enlarged by the inflammatory process,

distinct arterial pulsation is observed. When the aperture in the membrana tympani is small, and near to the middle of the membrane, such pulsation is not often seen, but it is more frequently observed in cases where the lower part of the membrana tympani is lost, or where an aperture of somewhat large size exists in this part of the structure ; in such cases granulations sometimes shew themselves around the edges of the morbid opening, thus tending to lessen its diameter ; there is commonly more or less discharge, bathing the surface of the granulations, and when the parts are in this state the speculum may be used, and an attentive view taken, without anything of pulsation being observed ; but if the discharge be now carefully removed, so as to obtain a clear view of the surface it conceals, pulsation, in some cases, is clearly seen ; but it commonly happens that the pulsating vessel itself cannot be perceived, its movements being known of by the impulse it gives to the edge of the aperture in the membrana tympani, or to the soft and yielding structure of granulations in this neighbourhood, the beating of which on the floor of the tympanum can be seen with the aid of the speculum.

A very complete illustration of these remarks has lately come under my notice, in a case of otorrhœa with perforation of the lower part of the membrana tympani. On more than one occasion when the bottom of the meatus in this case has been attentively viewed with the speculum, a bubble formed of the air just blown from the Eustachian tube through the mucus of the tympanum has rested apparently within the bounds of the aperture in the perforated membrane, and has there displayed, in a very beautiful manner, the pulsations received from the arterial action in its vicinity.

Otorrhœa. Granulations, formed within the Tympanum, pressed through an aperture in the Membrana Tympani, by efforts of Expiration.

In some cases in which perforation of the membrana tympani is met with, the patient is not able to blow air through the Eustachian tube to the exterior: the obstruction may exist in the Eustachian tube, in the tympanum, or in both, the meatus being supposed to be free. In some rare instances of this kind, the atmospheric air, sent towards the tympanum, produces

there a visible effect on the yielding soft parts, although not itself driven across the tympanic cavity.

A young man, now under my care, suffers from left side otorrhœa, with perforation of the membrana tympani, and obstruction of the tympanum or Eustachian tube, so that he is not able to effect any complete perflation of the drum; nevertheless, when air is pushed towards this cavity, a small nipple of red granulation, from the tympanum, makes its appearance within the bounds of the opening in the membrane, and recedes again towards the tympanic cavity, as soon as the expiratory effort is stopped.

Such a phenomenon, in physical diagnosis, has some value, viewed in connection with the state of the Eustachian tube, and tympanum, as well as with that of the perforated membrana tympani. In such instances, it is probable that the main obstruction exists in the tympanum, rather than in the Eustachian tube, otherwise the air pressed from the throat would not reach far enough in the direction of the membrana tympani to act upon granulations immediately behind it.

In this case, the bottom of the meatus being first carefully freed from discharge, so as to remove any obstruction which might be in the way of the aperture

in the tympanal membrane, a weak solution of nitrate of silver was poured into the external meatus, with a view to its reaching the tympanic cavity, the descent to which is favoured by a suitable inclination given to the head of the patient at the time the fluid is introduced.

It is easily understood that treatment of this kind may require to be persevered in for a considerable time, and may hereafter, perhaps, be aided by therapeutic agents, directed to the Eustachian tube by way of the throat, along with all requisite attention to the state of the mucous membranes, and to the general condition of the patient.

Otorrhœa. Chronic Otitis after External Injury.

September 27, 1853.—Elizabeth L., æt. 19, says that her hearing on the right side is good, but that she is deaf on the left side. The deafness is attributed to an accidental injury which occurred in childhood; she fell and hurt her head when running away in fear from a dog; there was no particular external injury inflicted at this time, but after about two months an unilateral head-ache came on, which affected the

left side of the nose, that of the face, (the lower jaw more especially,) and the left side of the neck, as well as the exact left half of the head ; all this subsided after two or three days, but ever since, or during the greater part of the patient's life, these left side sufferings have very commonly returned, and even from very slight causes ; taking cold, a little excitement—as from running, or over exertion, any accidental blow, or shake of the head, interruption, or irregularity in the catamenial discharge, being sufficient to reproduce them, when they continue a longer or shorter time, as from one to three weeks, in accordance, more or less, with the severity of the exciting cause. For these occasional sufferings the patient has used the steam of hot vinegar and water, directed upon the ear, head, and face, from which a little relief is generally obtained.

The affection, from the beginning, has been accompanied by a discharge from the left ear, of a light yellow colour, of purulent aspect, and now and then emitting a very offensive smell ; this fluid runs away in greater quantity when the left side of the head rests on the pillow, so as to favour its exit. When the pain in the left side of the head and face has

been increased by any of the accidental causes before mentioned, the discharge from the ear is at first diminished, but soon after increases in quantity, and when this increase takes place, the uneasiness or pain in the head, ear, and face forthwith abates.

Looking into the external meatus, considerable difference is observed in the appearance of the two ears; on the right side, where the aspect is nearly normal, the meatus is of medium size, lined with brown cerumen, and allowing the membrana tympani to be seen at the bottom; while, in the left ear, the canal is much narrower than natural, lined by a yellow adhering deposit of hardened material, from the purulent secretion, and a portion of this fluid secretion rests on its lower part or floor; but a very small portion of the membrana tympani can be observed, and this is coated with pus; at the more external part of the canal the cuticular lining is reddened, and the sensibility of the parts increased.

Not only have the sensations in the left side of the head and face been affected in the progress of this malady, but the motor apparatus also seems in some measure to have come under its influence; this has been shewn mainly by the fact that the power of the

lower jaw is at times much diminished on the left side, so that mastication has to be performed on the right side, and this, not because the act of chewing gives pain in the left temporo-maxillary articulation, or adjacent parts, but from a real feeling of weakness in the lower jaw on the affected side ; a want of power, which is not accompanied by any sensation of tenderness of the parts within the mouth, where, as well as in the fauces, and tonsillar regions, everything has its natural appearance.

In this case the affection of the facial and of the fifth pair, as well as that of the auditory nerve, requires especial attention.

Remedies : left ear syringed ; blister applied to left arm, below the insertion of the deltoid, with the view of establishing a vicarious discharge, the progress and keeping up of which might facilitate the treatment of the purulent otorrhœa, and render its suppression less hazardous.

October 8.—Otorrhœa has subsided, and the hearing is much improved.

October 18.—There has been no return of the otorrhœa, and the improvement in hearing progresses.

The right ear appears to be nearly in normal

condition, and with the left alone the patient hears conversation at an ordinary pitch of the voice.

The continued otorrhœa is an interesting feature of this case; it does not occur in all instances of deafness following blows on the head; so that, on this account, we are the more induced to consider the possibility of some other cause having operated for its production in the early life of the patient; it cannot, however, be clearly ascertained that there was any other cause than that which has been already mentioned.

Before the temporal bone is converted into one compact and resisting mass by complete ossification,—in other words, when the bony part of the meatus auditorius externus has not, as in childhood, attained to that hardness which it afterwards acquires,—an injury inflicted upon the ear might not only harm the structures of the meatus, but also interfere with the after development of the canal; such a consequence of external injury would be more likely to present itself in scrofulous, and tubercular, than in healthy and vigorous constitutions.

In the case here related there was no indication of the tubercular diathesis, in connection with which

otorrhœa is often more easily produced than suppressed. The left meatus having been repeatedly cleaned, we now see a sort of false membrane at the bottom of it, coating, as it were, the exterior surface of the membrana tympani, upon which a solution of nitrate of silver is to be occasionally dropped.

Otorrhœa of many years' duration.

March 21, 1853.—John M., æt. 17, has been deaf from infancy; the right membrana tympani is opaque; the left also opaque; with narrowing of the deeper part of the left meatus, and otorrhœa.

We occasionally meet with a sort of otitis, or otorrhœa neanatorum, which, if neglected, may lead to disease of the membrana tympani, and of other parts of the organ of hearing, as certainly as the ophthalmia neanatorum leads to opacity or complete destruction of the cornea and other parts of the eye.

In some cases in which the eye is lost soon after birth, we find that the development of the orbital part of the frontal bone is afterwards modified by the abnormal condition of the visual apparatus, and to this we may compare certain abnormal states of the

petrous portion of the temporal bone which are now and then observed, in cases where the auditory apparatus has suffered in very early life.

A very well marked difference, however, between the two cases should be carefully noted, for it might be said that the integrity of the petrous portion of the temporal bone is much more frequently disturbed by aural diseases than is that of the bones of the orbit by the progress of ocular complaints; and this is the more important, inasmuch as the healthy state of the former is more essential to hearing than is that of the latter to sight.

For this case, water in which iodine had been agitated, was employed as a lotion, dropped into the meatus, which had been previously cleared out three times a day; this application was continued for a fortnight, and the drops of nitrate of silver afterwards used.

May 21.—For some days the patient has been free from otorrhœa; he has lately taken the compound decoction of sarsaparilla freely, with small doses of iodide of potassium; the hearing has improved, and the narrowed meatus looks better than before; its cuticular lining appears thinned, and hence its calibre increased.

Otorrhœa of many years' duration.

September 5, 1854.—William R., æt. 24, has suffered from otorrhœa on the left side ever since he can remember, and has had discharge from the right ear during the last eight years. The right meatus is very narrow, its anterior and posterior walls being approximated so as to give it the aspect of a slit. The left meatus is altered at its deeper part.

The tick of the watch is “faintly” heard when closely pressed upon the right ear, but on the left side it cannot be perceived. The tonsils are much enlarged. Inflation of the tympanum cannot be heard with the otoscope on either side.

Iodine internally; glycerine to the meatus.

In this case iodine was given internally, afterwards iodide of potassium and sarsaparilla, and gradual dilatation of the narrowed meatus was practised with the aid of pieces of gutta percha of suitable form and size. A weak solution of nitrate of silver was directed to be instilled, with the view of gradually checking the otorrhœa. Catheterism and inflation of the Eustachian tube on both sides were practised.

The patient was seen three months after the

commencement of the treatment, when the hearing had improved, and the right side otorrhœa had disappeared; the meatus, by this time, was much widened, the thickening of its lining membrane being considerably diminished.

In such cases, the catheterism of the external meatus, if so it may be called, should be practised in the most gentle manner, with a view to that favourable kind of action which is sought to be produced by bougies on the vital conditions of the urethra, in certain cases of stricture; if the dilatation be attempted too rapidly, harm, rather than good, will be done.

Otorrhœa.

August 2, 1854.—M. A., æt. 47, a married woman, has a nearly complete closure of the right meatus, from chronic inflammation affecting the subcutaneous tissue, as well as the lining of this canal. Otorrhœa prevails, and the yellow, inspissated, and hardened discharge is seen oozing from the meatus into the concha. The hearing is but little affected.

The patient attributes the attack, which came on

about three weeks ago, to her hard labour in hot weather, but more especially to carrying heavy loads on her head: the catamenial discharge having lately ceased, and the patient being a strong, vigorous woman, help to account for the occurrence of the disease, as well as to suggest the remedies required.

The internal remedies prescribed were—infusion of gentian with sulphate of magnesia, along with a dose of aloe and blue pill, three times a week; the external and local applications were—a blister to the outer side of the right arm; frequent injection of tepid water into the meatus, so as to wash away the pent up purulent discharge; a long and small piece of lint being passed deeply into the meatus after each application of the syringe, and there left, to receive as much of the discharge as its substance would absorb.

The treatment was commenced by the application of two leeches in front of the ear; and in the course of a fortnight the cure was completed, and the general health of the patient good.

Cases of this kind might seem unimportant, the parts first affected not being essential to audition, and the hearing, for a time, not much injured; they should not, however, be left without active treatment, for

the external part of the meatus being, in some cases, so completely closed, matter may accumulate upon the membrana tympani, and thus lead to inflammation, thickening, and opacity, if not to ulceration and perforation, of this important structure.

It is occasionally found useful, in cases of this kind, where the sensibility of the parts is not extreme, to pass a small tube into the meatus, and there leave it to assist in draining away the fluid from this canal, which may be received upon a little cotton left at its outer extremity, or in the concha. A piece of the lesser, or closed end of a small quill, perforated at the closed end, but without cutting off its rounded extremity, and about an inch long, answers the purpose very well; the quill, after immersion in warm water, may be a little flattened by compression while yet warm and soft, and the smaller end passed into the meatus, the wider part being left to rest upon the cotton in the concha.

Otorrhœa. Repeated Otitis.

January 27, 1854.—Arthur W., æt. 18, is extremely deaf; shouting is required to make him

hear. The affection is attributed to cold ; the patient says that there was no other cause ; that he used, as a boy, to run about barefoot in all kinds of weather ; that he suffered from ear-ache, with discharge from the right ear, when twelve years old ; that this right side otorrhœa, with ear-ache, has frequently returned, its last attack having occurred about three months ago ; ear-ache, with otorrhœa, also prevailed at one time on the left side, but he has not suffered from it for some years back.

The patient cannot hear the tick of a watch, although closely pressed upon the auricle, on either side. The tympanum is inflated on both sides, shewing the patent condition of the Eustachian tubes. On both sides the membrana tympani is opaque, and appears to be thickened.

This is one of a very numerous class of cases of disease of the ear ; in other words, one in which the auditory organ is seriously injured by frequent exposure to wet and cold.

It is obvious that human beings ought not to suppose that they may expose themselves to wet and cold, and to all vicissitudes of weather, with impunity, as if their organisation completely resembled that of

the out-door domesticated animals by which they are surrounded ; for the difference in the lower extremities, more especially in the foot, as well as that of the skin and its appendages, helps to shew how much greater is the danger to man, even in his most hardened state, than is that to which such animals are exposed.

The great extent of the cutaneous surface of the foot, and the manner in which the tegumentary covering of the body sympathises with it, as well as the naturally unprotected state, and, consequently, varying condition of the skin and external ear, require to be noticed as frequent helps to the occurrence of aural disease in man, while the opposite states, in many of the lower animals, where a solidungular cleft, or clawed foot, presents a limited surface to the varying soil,—where the skin is constantly protected by the same covering of hair, wool, or feathers,—where the great development of the external ear, often more or less pendulous, and warmly enveloped by the natural clothing of the body, all tend to the complete protection of an organ which is so much more exposed in the human being.

Otorrhœa after Scarlet Fever.

February 18, 1853.—E. J., a strong young man, æt. 19, apprentice at a cooperage, where he has worked since the age of 14, much exposed to the weather, and not a little deafened by hammering and other kinds of noise, had “scarlet fever” at the age of 4, and has had otorrhœa on both sides ever since; the meatus, right and left, is moistened by purulent discharge, is contracted at the deeper part, and not in a condition to allow the membrana tympani to be seen. Inflation of the tympanum is heard on both sides, but faintly. Hears the ticking of a watch on either side, when held about two inches from the auricle.

The variations of weather to which the patient, in working at his trade, is so constantly exposed, seem to tell very unfavourably upon his general health, as well as upon the organ of hearing; he is often attacked by severe colds, with cough of long duration, and whenever the bronchial affection is severe the audition is further impaired.

Frequent cleansing of the meatus, with the after application of a weak solution of nitrate of silver, are recommended.

March 10.—The patient has lately had a fortnight's rest, and during this time has taken every possible care of himself; meanwhile the meatus has been cleansed several times a day, and every morning and evening the nitrate of silver solution has been dropped into the ear; he has also taken cod-liver oil from the commencement of the treatment, and feels his general health much better than before; the otorrhœa is now scarcely apparent, and the hearing distance for the tick of the watch is, on both sides, three times what it was at first.

April 11.—This patient has benefited by treatment; but, if circumstances did not interfere very much, he ought to change his occupation for one in which he would not be constantly exposed to vicissitudes of weather and deafening noises, for we cannot help expressing a regret that any youth with an organ of hearing conditioned like that of this patient should be exposed to external agents so likely to increase, set up, or keep up a morbid state of this extremely delicate apparatus.

Nothing can be more unfortunate than the occupations occasionally selected for young men who suffer from diseases of the ear; in Liverpool we often find

them amongst ship-carpenters, coopers, boiler-makers, engine-drivers, cabmen, workers in sugar-houses, &c., not to mention many other pursuits in connection with which the ear and general health are apt to suffer from vicissitudes of temperature, either from atmospheric changes alone, or from alterations connected with the exposure to intense artificial heat, which the patient, from time to time, suddenly quits for the ordinary temperature of the atmosphere.

In cases where long continued otorrhœa from any cause exists, the sufferer betaking himself to such occupations will probably not continue his labours many weeks before he suffers from increased intensity, or more frequent exacerbations of his malady.

Soldiers who may now and then have to make forced marches are not selected with wooden legs, and men with diseased ears should not be placed in circumstances so much opposed to the conditions of their organisation, and hence to their bodily and mental comfort — to their happiness and progress in life.

Otorrhœa after Fever.

August 18, 1854.—Ellen B., æt. 18, had an attack of “fever,” about seven years ago, and has ever since been, to use her expression, “completely deaf.” Otorrhœa, on the right side, has prevailed during the whole time of the deafness; nevertheless the right ear is less deaf than the left. Bronchocele commenced at the same time as the deafness, and is now, on the right side, as large as the egg of a duck, on the left it is less developed. The calibre of the meatus is diminished on both sides, and the membrana tympani cannot be seen on either side.

It is worthy of notice that scarlet fever, measles, chicken-pox, small-pox, and also typhus, are all of them now and then followed by aural complaints, of which inflammation of the tympanum, with its various consequences, is a frequent form; after typhus, however, deafness, apparently connected with affections of the labyrinth, or with encephalic disease, is occasionally met with; in this patient, the malady of the auditory apparatus is such as frequently follows attacks of scarlet fever, accompanied by anatomical alterations telling upon the tympanum,

and the neighbouring part of the external meatus ; and, along with these changes in the ear, we have characteristics of the strumous constitution, with a large bronchocele, the development of which appears to have commenced about the time when the system had undergone the weakening influence of the fever above alluded to ; the information respecting this fever being somewhat vague, it is not easy to determine whether the patient suffered from typhus or scarlet fever, probably it was from the latter.

Abscess below the Ear. Otorrhœa.

January 12, 1855.—J. F., æt. 28, suffers from a large abscess immediately below the right ear, which is now pointing and ready for the lancet ; pus is flowing from the meatus, as if a purulent collection had previously burst within this canal, and, on inspecting the tube, after washing it out, this would seem to have been the case ; the floor of the meatus, in its external or moveable part, is lifted up by purulent collection below the ear, the collection having gone on increasing after the bursting within

the meatus had taken place, and this for a reason which is quite obvious, for the small opening by which the matter enters the ear is seen as a little papilla on the floor of the tube, about its middle, or close to the commencement of its bony portion, and this aperture being in the soft or moveable part of the canal, it is lifted up and pressed against the roof above it, as well as compressed, and in great measure closed, by the general swelling of the lining of the meatus, the deeper part of which is entirely shut up; hence it is readily understood that the small opening within the ear is altogether unequal to the draining of the abscess, the purulent collection within which, has not been relieved by its occurrence, but has subsequently gone on to the formation of a large sac turning round the lower and back part of the ear. This collection was largely opened beneath the lobe of the ear, and thus about an ounce of thick purulent matter evacuated, the thinner parts of the contents of the abscess having apparently run off, gradually, by way of the aperture within the external conduit.

The patient attributes this attack of phlegmonous inflammation in the aural region to exposure to cold;

and it is now about a month since he first felt pain in the ear; when he rose in the morning this pain, "from morning to morning," increased, and to remedy it, he was persuaded to drop *brandy* into the ear, which he did; after which the inflammatory action seems to have gone on more rapidly, attended with intense pain in the night, from which the sufferer had a little respite during the middle of the day.

January 30.—The patient has completely recovered; a little thickening of the lining membrane of the meatus remains behind, but he no longer complains of deafness; and as there does not seem to be any characteristic of scrofula in connection with the case, there is every reason to regard the recovery as well established.

It is quite evident that in cases of this kind, which, at first, may be said to have nothing to do with the ear, it is desirable to give vent to the accumulated matter at a very early period, so as to save the proper structures of the auditory organs from that injury which they are likely to sustain from the progress of inflammation, and of a purulent collection in their neighbourhood; to which it may be added, that, in cases of this nature, the pain often

endured is most intense, the structures surrounding the collected matter being dense, strong, and unyielding, so that the early application of the abscess lancet may often ward off an immense amount of torture.

Otorrhœa. Deafness. Otitis. Rheumatism.

November 10, 1853.—E. B., æt. 27, a married woman, always enjoyed good hearing until the month of May, 1853, when right side otitis occurred, during which considerable pain in the right ear was complained of, especially at the time of mastication, or speaking; the patient says that every word she spoke seemed to go into it. With the aid of active antiphlogistic treatment, leeches, and blistering, with a little calomel, opium, and aperients, accompanied by emollient applications to the affected part, and the frequent washing of the meatus with a little warm water in which extract of hyoscyamus was dissolved, the otitis was subdued, and the healthy condition of the organ restored.

On the 27th *October*, now a fortnight ago, she was attacked on the Sunday morning with violent pain in the left ear, extending to the jaw, temple,

and side of the neck ; the ear, as she expresses it, went on “bealing and bealing” until the following Saturday morning, when all at once it broke, and sent forth a profuse discharge of yellow purulent matter, which, in a few hours, was followed by a discharge of blood.

During the last week a profuse purulent otorrhœa has continued, accompanied by considerable pain, and there is at present great uneasiness in the ear, and a sort of “creeping pain” on the left side of the head above it ; while, from the meatus, a quantity of whitish-yellow pus is flowing, and this being washed away, the bottom of the canal is found lined by a white deposit which coats the membrana tympani, hiding it and the neighbouring part of the meatus from view ; and the hearing is so far lost that the ticking of a watch pressed upon the auricle is not perceived at all on the left side, although audible at the ordinary distance on the right. Air enters the tympanum from the Eustachian tube on both sides. The antiphlogistic and soothing treatment previously employed on the right side is now used on the left.

In this case the left side otitis is accompanied by severe rheumatic pains in the loins, thighs, and knees ;

and in May last, when the right ear was similarly affected, corresponding rheumatic complaints prevailed ; and the patient also suffered from an interruption of the catamenial discharge, as well as from great grief and mental anxiety, while she was crossing the Atlantic, on her passage from New York to Liverpool ; the ear affection commencing immediately after her arrival in the Mersey. At present the season of the year is very unfavourable to her recovery ; remedial measures in such a case requiring, and, as it were, being dependent on, the assistance of suitably warmed apartments, with well regulated clothing and diet.

January 6, 1854.—This patient, after struggling much with her rheumatic and aural affection, is now gradually recovering, having yet some remains of otorrhœa, which is being combated by the nitrate of silver, blisters behind the ear, and the iodide of potassium with sarsaparilla.

Otorrhœa, Disease of the Ear following the removal of a great portion of the Hair. Increased Deafness after Parturition.

October 29, 1853.—Sarah T., æt. 30, was placed in a public school at nine years of age : she had

very long hair, and the first thing done was to cut it quite short, after which she immediately became deaf, and about six months after left side otorrhœa began, with very offensive discharge, which, with occasional interruptions, has continued ever since.

The left meatus is found lined with a considerable amount of muco-purulent matter, which being removed by the syringe, a diseased state of the membrana tympani is observed, its surface being nearly covered by florid red granulations, which evidently assist in keeping up the aural discharge. The right ear is in normal condition.

The patient was married at eighteen, and in nine months time she had twins—two boys—after a very hard labour of sixty hours' duration ; and immediately after this confinement the deafness was considerably increased, as she thinks, from the straining and great efforts which she made at the time. Prolapsus uteri occurred as soon as she began to move freely about, and has ever since continued. She has had six children since, and after each parturition the deafness has been for a while increased, apparently without tympanitis.

Violent efforts of the muscles and other organs of respiration, are often followed by more or less of

deafness, and as the apparatus of breathing is so much tried during the terrible strains of hard labour, it is not surprising that consequences such as those alluded to above should have followed parturition, after which co-phosis, as well as amaurosis, is now and then met with.

In this case some relief was afforded by the instillation of a strong solution of nitrate of silver; under its influence the discharge diminished and the granulations assumed a more healthy appearance, but the benefit to the hearing was very limited.

The patient was recommended to wear a pessary, on account of the uterine descent, and the adoption of this means of relief was followed by very great improvement in both the local and general condition.

Otorrhœa, suppression of, followed by bad health.

January 4, 1853.—W. D., æt. 15, suffered from otorrhœa from the age of six to that of ten months, during which time his health was good, but the aural discharge ceased after four months' duration, and the general health at the same time failed, and has ever since continued bad.

The membrana tympani is opaque on both sides; the tonsils are much enlarged; the mucous membrane of

the pharynx and soft palate, red and relaxed ; the lining membrane of the nasal cavities has that thickened, red, and morbid aspect, so often met with in serofulous children ; great deafness prevails. The tick of the watch pressed closely upon the auricle is not heard on either side.

If, in all such cases, moderately warm and dry climate, good diet, well regulated exercise, attention to the functions of the skin, and of the digestive organs, &c., &c., could be recommended, the necessity for medical aid would in great measure yield to the efficiency of hygienic treatment. In this case, the wearing of flannel, occasional tepid salt-water baths, and the taking of cod-liver oil, along with suitable attention to diet and exercise, were evidently indicated, and, of course recommended, but the patient was not afterwards seen.

The failure of the general health after the cessation of the aural discharge is worthy of notice ; it is easily understood that the suppression, if at all sudden, of any considerable discharge of this kind, in so young a child, might tell unfavourably upon the constitution, either from the real cessation of the purulent secretion, or from the absorption of pus—the excretion of which might be interfered with.

Otorrhœa. Cessation of Otorrhœa. Extreme Deafness.

April, 28, 1854.—Eliza W., æt. 22, a healthy-looking young woman, had measles at four years of age, which was followed by left side otorrhœa; this continued during twelve months: her mother says that she was recommended not to attempt to stop the discharge, but that it disappeared spontaneously at the end of the year. After the disappearance of the otorrhœa the patient became very deaf on the left side, and has remained so ever since. On the left side the watch is not heard, even when closely pressed upon the auricle; on the right side hearing is not complained of. Tinnitus, on the left side, is troublesome, and is much increased when the patient is in the horizontal posture—partly influenced, it is probable, by the altered condition of the cerebral circulation.

In many cases of this kind which occur in practice, the account of the patient respecting the mode of occurrence of the deafness requires to be received with much caution; patients are not always willing to tax their memory very much with regard to the antecedents of their present condition, the accurate

report of which they but too frequently appreciate in a very inadequate manner: in the instance just related, the otorrhœa is said to cease, and then the deafness immediately to occur, and the two have long been ranged in the mind of the sufferer in the light of cause and effect, while, in reality, it is exceedingly probable that during the time when the otorrhœa prevailed, there was also more or less of deafness, which for some time, both before and after the cessation of the discharge, continued to make gradual progress; there is, however, no doubt that, in some instances, extreme deafness follows very rapidly on the cessation of otorrhœa; this may now and then be caused by hardened materials stopping up the narrow tympanal extremity of the Eustachian tube, the tympanum itself, within which the membranes of the fenestræ may be affected, or the deeper part of the meatus; for it is worthy of remark that in cases of otorrhœa, perforation, or even total destruction, of the membrana tympani, has taken place, in perhaps a much greater number of instances than is generally supposed; and in practice we have very frequent opportunities of observing instances in which otorrhœa and deafness came on at the same time; but in the progress of

such cases, when, as often happens, deafness is gradually increasing, the otorrhœa accidentally ceasing should not be looked upon as the sole cause of the loss of audition.

Otitis Externa, Otorrhœa. Deafness. Antiphlogistic treatment.

September 28, 1853.—A. L., æt. 3 years, has suffered from left side otorrhœa, and deafness, during the last fourteen days, but never had any previous affection of the organ of hearing. On the affected side the external ear is redder, and warmer, than on the other; the meatus is narrower than natural, and lined with thin white purulent matter; the membrana tympani is not seen.

One leech applied immediately in front of the ear; evaporating lotion to external ear and temple, with an aperient mixture.

October 3.—Redness of external ear is less, and the otorrhœa has diminished, but there is yet a little redness of the auricle remaining, and the meatus, as a whole, is less than that of the opposite side. The previous and present states shew how easily otorrhœa

depending upon inflammation of the external meatus may be combated at an early period by purely anti-phlogistic treatment.

October 5.—The weather is now wet, cold, and windy, and within the last two days a return of offensive purulent discharge from the ear has come on.

October 8.—A second leech was applied yesterday in front of the auricle, and there is, this morning, no appearance of discharge.

October 11.—The discharge has quite ceased, and the hearing is completely restored.

October 18.—There has been no return of disturbance in the ear.

Cases of this kind are most frequently met with in the winter months; delicate, sickly, and scrofulous children, if not well nursed and taken care of, being most likely to suffer: when the patient has once regained the normal condition of the ear, the recurrence of the malady may commonly be prevented by suitable attention to the functions of the digestive organs and skin, to diet, clothing, and exercise.

Infantile Otorrhœa. Opacity of the Membrana Tympani.

M. R., a young girl, æt. 11, was attacked by otorrhœa, at the age of six months, which continued during ten years. The meatus, right and left, is of very large size, and the membrana tympani on both sides opaque. Great deafness prevails.

We now and then meet with cases of otorrhœa in new-born, or in very young children, which, if left to themselves, are apt to be troublesome, and long-continued, and they may be as fatal to the ear as purulent ophthalmia but too frequently is to the eye at the same period of life; in such cases an irritable state of the surface, or ulceration behind the auricle, sometimes co-exists; the affection of the meatus should be treated first, while the more external affection may be allowed to prevail for a time: drops with sulphate of copper, sulphate of zinc, or nitrate of silver, will commonly suffice to subdue the otorrhœa; these, in some cases, may be followed by the instillation of astringent infusions or decoctions—as of tea, quassia, cinchona, oak-bark, nut-galls, &c.

These remedial applications should always be made to a clean surface; in other words, the meatus should

be carefully washed out before the drops recommended are instilled, otherwise they mix with the discharge, and thus can only influence the morbid surfaces in an indirect, feeble, and unsatisfactory manner.

This patient was recommended to take very small doses of iodine, night and morning, for a short time, afterwards to take a long course of cod-liver oil, and to have a weak solution of nitrate of silver dropped into the external meatus twice a day during a fortnight. The patient was seen about a month after the commencement of this treatment, but hitherto the hearing did not seem to have improved.

Otorrhœa. Opacity of the Membrana Tympani.

October 18, 1853.—C. F., æt. 8, a serofulous little girl, has suffered from conjunctivitis, of serofulous character, and within the last eight weeks has been deaf; the membrana tympani has lost the evenness of its surface, an irregular white appearance being seen on both sides; otorrhœa likewise prevails.

October 20.—The use of a weak solution of nitrate of silver dropped into the ear has checked the otorrhœa, and the hearing is improved. The ocular irritation

and photophobia were much lessened by the application of pieces of lint steeped in a solution of extract of conium, and placed over each eye within a fold of very thin old linen ; when dry, or hard, the pieces were removed, dipped in lukewarm water, and re-applied.

These local remedies were accompanied by the administration of quinine, with infusion of roses, and tincture of hop.

November 21.—The patient is free from disease in the eye, and the otorrhœa has not returned ; a small surface *behind* each ear is kept in a state of slight irritation by the occasional touch of a pencil of nitrate of silver, with a view of guarding the patient against the return of either the ocular or aural complaint.

Otorrhœa.

November 29, 1853.—M. T., a little girl, æt. $2\frac{1}{2}$ years, has had left side otorrhœa, without apparent cause, during the last three months.

In such cases, although the cause may not at first sight be very apparent, a little inquiry often suffices to shew what it has probably been ; amongst the children of the poor a combination of circumstances,

with which impure air, exposure to the weather, want of cleanliness, and bad diet are too often associated, will be found to be a common source of aural, as well as of ocular maladies; and the case here noticed was of this class.

December 12.—The meatus has been carefully cleared out twice a day with lukewarm water, and a weak solution of nitrate of silver afterwards dropped in: the otorrhœa has now quite disappeared.

In such cases, it is better not only to clean out the meatus, but also, as much as possible, to dry its surface before the nitrate of silver is dropped in; in this way the stimulating solution at once touches upon the part where it is intended to act: this caution appears to deserve repetition, in clinical reports relating to diseases of the ear.

Otorrhœa.

October 22, 1853.—M. M. G., a boy, æt. 11, suffered from ophthalmia eighteen months ago; twelve months ago, right side otorrhœa commenced, and within the last six months enlargement of glands, on both sides of the neck, has prevailed.

This is one of the cases, of such frequent occurrence, in which a bad state of the general health is accompanied by morbid conditions of the organs of sense, and the mucous membranes ; and for which pure air, good diet, moderate exercise, and early rising, are of more avail than iodine, iron, quinine, gentian, sarsaparilla, or cod-liver oil ; but remedies selected from groups of this kind, *with* the hygienic agents just alluded to, will generally be of the greatest service.

In such cases, the functions and condition of the skin should never be lost sight of ; practitioners too often neglect this extensive structure, even when they pay very close attention to the mucous membrane of the digestive tube ; and this is the more to be regretted, inasmuch as the tegumentary covering of the body is, in some countries, so apt to be neglected by patients themselves.

In this case the right side otorrhœa disappeared after a weak solution of nitrate of silver had been dropped into the ear during ten days ; and the patient took a long course of cod-liver oil, with decided benefit to the general health, as well as to the condition of the neck.

Otorrhœa.

November 30, 1853.—Alice H., æt. 10, has been deaf on the left side during the last five years, the loss of hearing being attributed to cold taken in a new house which her parents occupied at the time the aural affection came on; otorrhœa has prevailed from the first, now and then ceasing for seven, ten, or fourteen days together; and it is remarked that during the absence of the aural discharge the hearing is worse.

At the bottom of the meatus, on both sides, the lining membrane is thickened and red; the canal narrowed; and no satisfactory view of the tympanal membrane can be obtained. The inflation of the tympana cannot be heard; but, in children, this part of the inquiry is generally not very satisfactory, from the difficulty of inducing them to make the required expiratory efforts. For the tick of a watch, on the right side the hearing distance is four inches, on the left, two inches.

In this case the patient was directed to wear flannel, to keep the feet dry and warm, to have a nutritious and well regulated diet, to go to bed and to rise early, and to avoid attacks of cold. A large blister

was applied outside the left arm, below the insertion of the deltoid ; warm aperients were given twice a week, at first, and afterwards sarsaparilla, with a small quantity of iodide of potassium ; the ear was carefully washed out three times a day with the aid of the syringe, the meatus immediately after made as dry as possible, and then a weak solution of nitrate of silver dropped in. The blister on the arm was kept open during two months ; sometimes nearly healing, when it was retouched with the unguentum lyttæ. After a free discharge from the blistered surface on the arm had been kept up during one month, a small blister of the size of a shilling was applied over the lower part of the mastoid process on each side, these blisters were kept open during ten days, and then only allowed to heal in a gradual way. This treatment was followed by remarkable success ; the otorrhœa vanished ; the lining of the meatus, at its deeper part, became gradually less thickened ; a partial view of the membrana tympani was obtained, the opaque aspect of which was readily seen ; and the hearing distance for the tick of the watch, in the beginning of January, 1854, was six inches on both sides.

February 1, 1854—The patient, after taking cold,

has lately had a slight return of the otorrhœa, but this subsided after two or three applications of the nitrate of silver; and on observing the membrana tympani a week after this slight return of otorrhœa had subsided, it was found to be less opaque than before.

There is, now and then, a little practical difficulty in the treatment of otorrhœa in young females, when the period for the commencement of menstruation is *approaching*; as it may not then be desirable to blister any extensive surface so as to produce copious discharge from the denuded cutis; at such times it is well to limit the local remedies to the neighbourhood of the ear, and to encourage the uterine discharge by emmenagogues, or suitable hygienic means, and these will occasionally be found to assist the cure of the aural affection if once the normal uterine actions become well established, and return with regularity. The patient whose case has just been related was, however, somewhat too young for any considerations of this kind.

Otorrhœa.

December 21, 1853.—S. R., æt. 14, a healthy-looking dark-complexioned boy, had scarlet fever five years ago, and otorrhœa in the right ear for a short time afterwards, accompanied by deafness, from which he recovered when the otorrhœa ceased; hence we may easily suppose that the right ear was left in a sensitive state, and more likely to be attacked by future disease than the other.

During the last three months the patient has worked in a rice and spice mill, where his occupation compels him to pass much of his time very near to the boiler of the steam engine; so that he has been exposed to vicissitudes of temperature somewhat greater than usual, and during the three months alluded to has become very deaf, more especially on the right side; on this side the tick of the watch is only heard when closely pressed against the auricle; the membra *tympani* is opaque, looks rough, and thickened, but otorrhœa does not appear: tinnitus on the right side is complained of.

He is requested to remain at home for a few days, to apply a couple of leeches in front of the left ear,

and after three days a blister over the mastoid process ; and to take the compound decoction of sarsaparilla with small doses of iodide of potassium during three weeks.

January 21, 1854.—The patient has improved considerably ; this improvement is, no doubt, in great measure, due to the good care which he has lately taken of himself ; the leeching, blistering, and internal remedies have nevertheless had some share in bringing about his recovery ; these remedies, however, would certainly not have been equal to the restoration of the patient, had he not discontinued the daily exposure to sources of additional disease. And here it may be shortly stated that, in a considerable proportion of cases of ear disease, the occupation of the patient, and the physical or external agents which are telling upon him, should be carefully taken into account.

Otorrhœa.

February 18, 1854.—J. H., æt. 12, has been deaf during the last two years. The right tympanum is freely inflated, the left less completely so. The

meatus is moistened by a purulent discharge, on both sides, some concretion from which narrows the canals at their deeper part, and puts the membrana tympani out of the way of clear view.

The antecedents of the affection are not given in a satisfactory manner; the otorrhœa has prevailed during the last three months more than at any former period. The patient had measles four years ago, but it cannot be ascertained whether or no any aural affection followed immediately on the exanthematous attack.

Frequent cleansing of the meatus, and the nitrate of silver drops, are recommended; flannel to be worn next the skin, the feet to be kept warm and dry, and the patient not allowed to go bareheaded.

This is one of those cases of aural disease, of which many are met with in practice, where all the early history of the affection is lost in the long neglect of the patient and his complaint.

It is probable that a morbid condition of the organ of hearing followed the measles; that this was but little observed from the age of eight to that of ten years; that afterwards it attracted attention, when the wants of education were making greater claims

on audition, and when the growing intelligence of the boy enabled him to observe better his own malady, and more completely to direct the attention of others to the inconveniences from which he suffered.

Otorrhœa.

February 24, 1854.—Alice H., a girl, æt. 6, had ophthalmia one week after birth, and now suffers from opacity of the right cornea in consequence. Five days ago otorrhœa, on both sides, began; the deeper part of the meatus is contracted, and moistened with pus.

Neglect of cleanliness, bad air, bad diet, and inadequate clothing may be mentioned as the apparent sources of the malady in this little sufferer; and it is unfortunate that in such cases no substitute can be found for the good effects of more happy parental care.

After clearing out the meatus the solution of nitrate of silver was dropped in.

March 15.—The otorrhœa has disappeared, to return, perhaps, as soon as exciting causes again come fully into play.

Despite all the difficulties, good may often be done

in cases of this kind by insisting upon such care as is likely to prevent the return of the otorrhœa, more especially during the early part of life, when the disposition to its attacks is so remarkable.

Otorrhœa.

July 12, 1854.—J. C., æt. $6\frac{1}{2}$, a strong boy, never suffered in his eyes, or ears, until he had an attack of measles, about twelve months ago, ever since which he has had strumous ophthalmia.

The deeper part of the meatus is contracted on the right side, and the membrana tympani not seen. On the left side otorrhœa prevails, and an imperfect view of the moistened tympanal membrane is obtained.

The general health and constitutional peculiarity first demand attention; in this way the ocular and aural complaints may be indirectly benefited, and thus the influences of local applications considerably assisted.

Citrate of iron and quinine to be taken three times a day; the eye-lids to be painted night and morning with the conia collyrium of Frönmüller, with the view of relieving the irritation and photophobia which

prevail. The nitrate of silver to be applied to the cleared meatus.

August 10.—The ocular malady is completely subdued; and after the previous date the otorrhœa, for a few days, was not observed, but returned again when the nitrate of silver was put aside, and the patient neglected.

The difficulty of obtaining the requisite attention for these cases, and of having the little manipulations required for the local treatment well performed, interfere very much with the success which is hoped for by the practitioner.

Otorrhœa.

April 28, 1854.—B. E., æt. 14, found, about three years ago, that she was deaf on the right side, and has ever since remained so; right side otorrhœa all the while going on. The right meatus is filled with purulent matter, which hides the deeper parts from view; but this being removed, the canal is found to be narrowed in its bony division, partly, perhaps, by modified development, partly by a thick lining of white material adhering to its surface.

Menstruation commenced at the age of thirteen and a half years.

After taking cold the otorrhœa occasionally stops, when pain, with increased deafness, comes on, but after a few days the discharge re-appears, when the hearing improves, and the pain is no longer felt. From the account of the patient, as well as from that of her mother, she appears to have been much exposed to the ordinary causes of catarrh, whence the aural affection would seem to have been frequently aggravated.

May 27.—During the last month the affected meatus has been frequently cleansed with warm water, its inner surface now and then pencilled with the mild nitrated mercurial ointment; and with the view of checking the otorrhœa, which seemed to flow from altered surfaces outside the membrana tympani, drops of sulphate of copper, in the proportion first of five and afterwards of ten grains to the ounce of rose-water, have been employed, and with marked benefit; for the hearing is now considerably improved, and the discharge scarcely apparent.

June 15.—The discharge from the ear no longer appears, and the good hearing is restored; during the last fortnight chalybeates have been administered, the

patient is looking better, and is stronger than before, and the catamenial returns are regular. As soon as the otorrhœa had completely disappeared, a leech was applied in front of the ear, and repeated after four days; this was thought to be a desirable precaution, lest some inconvenience should follow the arrest of the aural discharge; the critical period of life at which the patient had arrived being looked upon as an additional reason for more than ordinary care; different affections of the nervous system, and amongst them hysteria and epilepsy, should be kept in mind as possible accidents in cases of this nature whenever the occurrence of the catamenia is prevented, or their return interfered with, more especially if any morbid, long continued, and habitual discharge be also stopped at a critical period.

In some instances, more or less of this kind, we find the external ear a little swollen, red, and hot, a few days after the cessation of the otorrhœa; for this state the application of leeches near to the outer extremity of the meatus is generally useful; while the occasional washing out of the meatus, even although it should appear dry, is not to be neglected.

Otorrhœa.

September 12, 1854.—J. L., a boy, æt. 7, has been deaf during the last twelve months, but has had otorrhœa, on both sides, from his mother's account, “ever since he was born.” The meatus is at present filled with a muco-purulent discharge; the tympanal membranes are opaque; and the patient has that peculiarity of countenance often characteristic of deafness. The tonsils are enlarged, the mucous membrane of the throat congested, the voice husky, and the respiration partakes of the character of snoring.

By careful examination it was ascertained that the membrana tympani was entire, although opaque, on both sides; the state of parts being such as would evidently favour a gradually progressing deafness, from further alteration of the membrana tympani, and of the deeper part of the meatus, to say nothing of changes within the tympanum or labyrinth.

It is not a little interesting to observe how long the pyogenic condition of the lining membrane of the external meatus, and external coating of the membrana tympani, may continue, without the occurrence of any ulceration which the naked eye can discover; in this

case, if the account of the antecedents be correct, such a state had prevailed during “seven years;” and hence it was obvious that the sudden or very speedy drying up of such a discharge was by no means desirable.

A blister was applied to the back of the neck, and kept open during a fortnight; next a blister was applied upon the right arm, when the blister on the neck was allowed to heal; and after the blistered state of the right arm had been kept up during three weeks, the left arm was treated in the same way. During the first fortnight of the treatment by blistering, the meatus was carefully washed out with warm water four times daily, and after the warm water had been employed, a tepid and strong decoction of cinchona was injected into the canal; under this treatment the otorrhœa on the right side all but disappeared, and on the left was considerably diminished; the next step was the instillation of a solution of nitrate of silver, six grains to the ounce, practised once a day for a week, and afterwards twice a day for a fortnight, at the end of which time the ear, on both sides, was quite free from any appearance of discharge.

The internal remedies employed in this case were

citrate of iron and quinine, afterwards cod-liver oil ; an alum gargle was also used, and the insufflation of the powdered alum upon the lining membrane of the pharynx was amongst the local means resorted to, and apparently with benefit, for the mucous membrane of the throat has now more of its normal appearance, and the character of the voice has improved.

This patient is reported to have suffered from otorrhœa during seven years, and from deafness but one year ; but it would, perhaps, be much more correct to say that during the earlier years of his life his imperfect hearing was but little, or perhaps not at all attended to ; for this is evidently very often true with regard to cases of deafness in young children belonging to the poorer class, where the importance of perfect hearing is now and then first discovered by the teacher, who may require it for the purposes of education ; this observation, it is readily understood, applies but rarely to patients in more easy circumstances.

Otorrhœa.

September 12, 1854.—W. D., æt. 10, a strong, healthy-looking boy, has suffered from right side

otorrhœa during the last two months; on this side the tick of a watch is not heard when closely applied to the ear. The deeper part of the meatus is narrowed by chronic inflammatory action, and red granulations, rising from its sides, keep the membrana tympani out of sight; this membrane, however, is probably entire, as air does not rush into the meatus when the tympanum is inflated, which the patient effects without difficulty.

A quinine mixture to be taken, and a solution of nitrate of silver to be dropped upon the granulations after the frequent washing with warm water, and afterwards warm infusion of catechu, have been for a time practised.

The patient was seen a month after the above date; the treatment recommended had not been regularly employed, and no improvement had yet taken place.

The case is, perhaps, worthy of notice in connection with the aspect and position of the granulations alluded to above; in such instances it is important to determine, if possible, the exact part from which such morbid growths arise, more especially if there be reason to suspect that they start from the interior of the tympanum, in cases where the membrane of the drum

has been perforated, or completely destroyed by ulceration, when it need scarcely be said that a persevering as well as a very cautious treatment will be required.

It should be borne in mind that in some cases of perforation of the membrana tympani, air cannot be blown from the throat to the exterior, on account of obstructions in the Eustachian tube, or tympanum—morbid states which complicate the perforation of the membrana tympani, and of which illustrations are afforded in other cases related in these pages.

Otorrhœa.

September 25, 1854.—J. M., a boy, æt. 12, has had otorrhœa on both sides during the last five years; the lining membrane of the auditory canals is of a deep red colour, and the deeper part of the tube on both sides filled with muco-purulent matter, which hides the tympanal membranes from view.

The canals cleared by the syringe, the tympanal membranes are seen to be thickened and opaque. The Eustachian tubes are pervious.

Audition is considerably altered, as the watch

requires to be closely applied before the tick is plainly heard.

In this case the otorrhœa was not preceded by any exanthematous attack.

The meatus to be carefully washed out with tepid water every four hours, a blister to be applied to the back of the neck, and a leech in front of each ear.

September 28.—Somewhat improved; the lining membrane of the meatus is less red,—the otorrhœa is less profuse; the patient is taking the citrate of iron and quinine, and is now to commence the instillation of drops with nitrate of silver.

October 20.—The lining membrane of the meatus has assumed its natural colour; the otorrhœa is not observed at all in the morning, but is occasionally felt towards evening; the hearing has improved considerably, as the patient now perceives the tick of the watch three inches from the ear on either side.

A good collection of cases of long continued otorrhœa (aural discharge, of some years' standing) would form a valuable addition to our clinical records in aural surgery, if the history of the cases were well drawn up, and their phenomena methodically and sufficiently analysed.

Otorrhœa. Possible effects of Loss of Hearing upon Character.

October 3, 1854.—W. M., æt. 12, a healthy-looking boy, with fair complexion, and blue eyes, has suffered from extreme deafness, with otorrhœa and very foetid discharge, on both sides, during the last eight years. A sort of eczematous eruption is observed in the outer part of the meatus, while its deeper part is contracted, and filled with a white cheesy-looking matter, hiding the tympanal membrane from view. The tick of the watch is only heard when closely applied to the ear.

It is worthy of remark that in this case the whole character of the boy is at stake; he is regarded as stupid because he is deaf, and, if the expression may be allowed, beaten and abused accordingly.

There seems to be nothing abnormal in the nasal or pharyngeal cavities or openings.

The ears to be washed out three times a day with tepid water into which a small quantity of powdered charcoal has been thrown; a blister to be applied to the back of the neck; an aperient to be administered, and afterwards the citrate of iron and quinine.

October 19.—The discharge has diminished in

quantity and fætor; the membrana tympani is seen to be opaque on both sides; the hearing remains much the same as before.

This patient was not afterwards seen; he was surrounded by circumstances of the most unfavourable kind; his deafness appeared to be attributable, in some measure, to the neglect of those who ought to have taken care of him, and his misfortune in the partial loss of one sense promises fairly to be the source of unhappy and defective character.

Otorrhœa. Foreign Body in the Meatus.

September 1, 1854.—Emma H., æt. 4, complains of pain in her left ear, the meatus of which is found to contain a small pebble, which, in size, may be compared to a large elongated pea. This was removed by the small jointed instrument, the analogue of that employed for the removal of calculi from the urethra by Leroy d' Etiolles.

September 4.—Otorrhœa prevails; a muco-purulent fluid of very pale colour oozes from the meatus: on account of this state of parts a little aperient medicine

was given, and strong tea injected into the canal three times a day.

September 7.—The irritation in the auditory passage and the discharge from its lining membrane have subsided, and both the hearing and health of the little patient are quite good.

Children, as is well known, frequently pass foreign bodies into the ear, and these bodies may, in a practical point of view, be divided into two classes:—

First, Hard bodies, which are not altered in either size or form by the heat or moisture of the auditory canal.

Second, Soft bodies—generally vegetable substances, such as peas, beans, or other seeds, capable of being swollen by heat and moisture after they get into the ear.

It is evident that the removal of foreign bodies from the meatus should be effected as soon as possible; a button, a bead, a bit of slate pencil, a small shell or stone, or any hard substance of corresponding size, is capable of producing great irritation, and hence inflammatory action, in the meatus and membrana tympani, so that its early removal is most desirable; but a seed, or other vegetable substance capable of

expansion, not to say of germination, should not, on any account, be allowed time for the alteration alluded to; for the suffering produced by any body of this kind expanding within the deeper and unyielding part of the meatus, and hence pressing upon its highly sensitive surface, is of a most distressing, not to say maddening character.

If the foreign body be very small, and with smooth surface, the injection of tepid water will often suffice to dislodge it, but if it fit more or less tightly in the canal, the fluid may not have sufficient power for its removal, when instruments must be employed to extract it; and it need scarcely be said that they should occupy very little space, otherwise they will be found unsuited for the purpose.

One instrument which will often be found very useful is a very small hook, or turn, at the end of a stalk of wire about two inches long, and fixed in a small ivory handle, such as is employed for lifting up the edge of the artificial eye when we remove it from the orbit; it may generally be passed on the flat to a point beyond the foreign body, and then turned round so as to be hooked upon it; the jointed instrument, in which the hook is produced by turning a screw,

after the instrument has been introduced as one straight piece, ultimately acts like the simple hook, and may answer the purpose very well, but its bulk is greater than that of the hook, and its application is more difficult, on account of its size, and also because it requires that the screw should be turned to give to the instrument its hooked form previous to the making of any extracting effort with it ; and although it might seem that such turning of the screw is very simple, and would scarcely occupy any time, it does, nevertheless, complicate the operation, especially when the patient is a young child, kicking and screaming all the while upon the table, or upon the knee of the mother or nurse.

A small scoop bent nearly to a right angle with its stalk, and perforated at the middle by a small hole, into which some projecting part of the foreign body might be received, and thus more or less firmly seized, is another form of instrument now and then useful ; it requires more room than the first-mentioned, but is simpler in its application than the second.

For the extraction of soft bodies from the meatus, this scoop, in addition to the turn at the end of it, may be provided with one or two short and sharp

teeth in the hollow of its bowl, which may assist in seizing any body, capable, from its softness, of receiving the prick, or impression, of such teeth; while the latter, from their position, in the hollow of the instrument, need not in any way damage the interior of the meatus. The scoop, thus armed, may be regarded as unnecessarily complicated; such a modification of it, however, is recommended for exceptional cases only. Upon the whole, the simpler the instrument employed, the simpler and better will the operation generally be.

Small dressing forceps, or a diminutive form of the ordinary polypus forceps, with eyes, or apertures, in the blades, so as to allow lateral or slightly projecting portions of foreign bodies to pass into, or through them, are amongst the most useful instruments employed; the surgeon should be prepared with curved, as well as straight forceps of this kind; and the same may be said of the spring, or dissecting forceps, of which those curved on the edge, as well as the straight ones, are sometimes useful; but the various forms of forceps which open with a spring, or in some other way, after being introduced in the closed state, seem not generally to answer the purpose as well as the simpler instruments above noticed,

although on exceptional occasions they may be found useful.

In cases of this kind, in children, or in other patients where the extraction of the foreign body is rendered difficult by the struggling of the sufferer, chloroform, if not contra-indicated, should be at once employed, as it may now and then be the means of saving the membrana tympani, the facial nerve, the hearing, or even the life of the patient.

In one instance which lately came under my notice, long continued and great efforts made for the extraction of a foreign body from the ear of a child, now some time ago, was followed by facial paralysis of the same side, apparently from bursting of the membrana tympani, and injury of the chorda tympani nerve — misfortunes, in part, caused by the violent efforts of the child to resist the attempt at removing the foreign body; in this case the struggles would have been quieted by chloroform, which was not then introduced to the practice of surgery.

Inflammation of Tympanum. Diseased state of Eustachian
Tubes. Otorrhœa.

October 5, 1853.—Ellen D., æt. 7 years, had small-pox four years ago, since which she has never heard well. About six months after recovery from the small-pox she began to suffer from violent nocturnal head-ache; the pain occurred “after her first sleep,” or at about eleven o’clock, p. m., and continued generally until about four in the morning; the mother speaks of the pain as having been of indescribable severity, so that the child’s head was held to prevent her injuring herself by violently tossing it about; this suffering continued unabated during three months, after which discharge from both ears commenced, when the head-ache immediately ceased. The cephalic pain was always increased if the clothing was not sufficiently warm, or if the patient got cold, and the right side of the head always suffered the most. Purgatives alone were employed.

The discharge occurred first from the right external ear, and about a week later from the left; on both sides it was very foetid, and of a mixed green and yellow colour.

The hearing distance is very limited ; the ticking of a watch touching either ear is heard, but on either side it becomes inaudible when removed one inch away from the auricle.

The external ear is of normal appearance. The meatus on both sides is narrow, and a view of the membrana tympani cannot be obtained. The patient is not able to blow through the tympanum on either side, so that the question relating to the integrity of the membrana tympani cannot be satisfactorily determined, either with the speculum or otoscope. The entrance of air to the tympanum is not distinctly heard on either side.

Inflammation and abscess of the tympanum probably took place on both sides ; and along with these, inflammatory disturbance and thickening of the deeper part of the meatus. The periodic return of the suffering is an interesting feature of the case ; this, however, is occasionally met with in inflammation of the tympanum. Six months having elapsed between the attack of the small-pox and the suffering from ear affection, the connection of the two is not very obvious ; but during these six months deafness prevailed, so that the organ of hearing had already

undergone, or was gradually undergoing, some morbid change.

It is probable that the Eustachian tube became closed, that matter was pent up in the tympanal cavity, and that a timely puncture of the membrana tympani might have been resorted to with great benefit; thus, much of the suffering might possibly have been prevented, and the mechanism of the drum preserved.

In this case the long continued inflammation of the middle ear seemed to have left behind it a diseased state of the Eustachian tubes, as well as of the tympanum, on both sides, for which catheterism of the auro-guttural canal appeared to be one remedial means clearly indicated, difficult as it might be in a subject of such tender age.

This operation was practised six times on each side, and on every occasion air was blown through the catheter towards the tympanum. The result of this treatment was in the highest degree favourable; the patient could afterwards hear the tick of a watch at the distance of four inches on either side, and the entrance of air to the tympanum could be distinctly perceived with the otoscope, but the air thus entering the drum did not reach the external meatus; so that

if the membrana tympani were formerly perforated by ulceration, some condition of repair had hereafter been established.

Otorrhœa of Eighteen Years' duration.

January 20, 1855.—Benjamin S., æt. 21, has suffered from left side otorrhœa since the age of three years. The tick of the watch is heard well on the right side, but the left ear does not perceive the tick unless the watch be closely pressed against the auricle. The left meatus is much narrowed; the membrana tympani, of which but a very small part can be seen, is opaque and white.

A seton was passed into the nape of the neck, and kept there during four months; the meatus was syringed with tepid water three times a day, and, as soon as the discharge from the seton became profuse, a solution of nitrate of silver was dropped into the affected canal every morning and evening for ten days.

The remedy next employed was a decoction of logwood, with which the interior of the meatus was syringed twice a day during about a month—the seton all the while remaining in the neck.

In ten weeks after the commencement of this treatment the otorrhœa of eighteen years' standing was entirely removed, and the hearing so far improved that the tick of the watch could be distinctly heard at the distance of four inches from the ear.

Otorrhœa.

October 20, 1855.—Hannah B., æt. 5 years, has suffered from left side otorrhœa during the last two years; her mother thinks that frequent falls on the head "had something to do with bringing it on"; the otorrhœa occasionally stops for two or three days, and, at such times, the deafness is much increased.

During the last seven months the discharge has been bloody, which seems to be accounted for by ulceration affecting the entire floor of the meatus; this discharge of blood is increased by crying, and it is greater when favoured by gravity in the recumbent posture.

On the left side the membrana tympani is opaque, and the condition of this membrane, as well as that of the lining of the meatus, suggests the application of a solution of nitrate of silver.

December 20.—Drops of nitrate of silver (ten grains to the ounce) were used three times a day during about a month, after which they were diluted, and a very weak solution having been gradually attained to, they were gradually left off; this remedy, aided by very careful attention to cleanliness, was found sufficient for the cure of the disease, the ulceration of the lining membrane of the meatus having been healed under its influence; the membrana tympani at the same time lost somewhat of its opacity, and the hearing gradually improved.

It is probable, that, in this case, the otorrhœa arose from some of the ordinary causes which lead to its occurrence in young children; and it may be well to remark, that by parents this affection is not unfrequently attributed to falls, when there is no very apparent reason for thinking that their view is correct.

Right and Left side Otorrhœa. Different conditions of the two Ears.

A young gentleman of fourteen has lately come under my notice, in whose case the changes in the

auditory organs associated with otorrhœa are peculiarly interesting. The affection followed a severe attack of scarlet fever, from which the patient suffered about eight months ago ; discharge from both ears, with extreme deafness on the right side, and a less degree of it on the left, having prevailed ever since.

RIGHT EAR.—In looking into the external meatus on the right side a red growth is seen, which, at first sight, suggests the idea that fleshy granulations or polypus may be sprouting outwards from the deeper part of the canal ; but, on clearing the passage and looking carefully at the real state of things, it is found that the red appearance belongs to the contour of the meatus itself, the deeper part of which is so much narrowed by thickening of its lining membrane that a mere slit or crevice is seen where the rounded and open tube should be found ; this filling up of the space within the bony part of the canal seems to be mainly effected by thickening of its lining, accompanied, possibly, by morbid growth within the tympanic cavity, for it is found that the patient cannot inflate the drum by way of the Eustachian tube, so that even this tube, as well as the cavity of the tympanum, may be in some measure influenced in its conditions and

capacity by morbid alterations of the mucous membrane which lines these parts.

It is easily understood that on this side, where the light cannot reach the site of the membrana tympani, nothing of this membrane can be seen ; but from the condition of neighbouring parts there is good reason to suppose that this structure has been entirely destroyed.

LEFT EAR.—On this side the patient hears the tick of the watch at the distance of a hand-breadth from the auricle, while on the right side its tick cannot be heard even when closely pressed against the ear. The vibration of the tuning-fork applied to the head is heard well on either side.

The membrana tympani is destroyed ; and as the deeper part of the external meatus is capacious, and not filled up by new growth, as on the right side, air is easily blown from the throat to the exterior, the state of the tympanum and Eustachian tube being such as to permit its easy passage, which is attended by a loud rattling noise, mainly produced by the rush of the air through the mucus with which the tympanum seems to be charged.

This case seems to illustrate, in some measure,

the importance of the central part of the atmospheric division of the ear — in other words, of the tympanum, shewing how necessary it is that this cavity should be charged with atmospheric air, as it is even yet on the left, or less deaf side, and not obliterated by new growth, as it appears to be on the right side. These two very different states of the ear are especially worthy of the attention of the practitioner, and it is of the utmost importance to watch their approach, or origin, and, as much as possible, favourably to modify their progress; for it is tolerably certain that in the case now under consideration, the fleshy growth affecting the meatus and tympanum on the one side, and the otorrhœa affecting the same parts on the other, would not have been found in their present state if suitable treatment — both general and local — had been adopted at an early period, and kept up in accordance with the various indications which might have been observed. It should evidently be borne in mind, that the prevention of morbid alterations which tend to fill up or to lessen the capacity of the deeper part of the meatus or neighbouring tympanic cavity is amongst the important practical considerations which belong to cases of this kind; for this, as well as

many other instances, more or less of the same nature, which have lately been noticed, tend to shew that we have a much better chance of favourable results in treating cases of otorrhœa with a free and empty tympanum, than we have when the drum of the ear is crammed by some living and morbid product; for, in the former case, the discharge being carefully washed away, and suitable topical remedies applied, a more healthy condition of mucous membrane is ere long attained to; but, in the latter, although the granulations, fleshy growths, or thickening of the parts affected be more or less removed, the tendency to a reproduction of like morbid structure is, in most instances, very strongly marked.

Otorrhœa, with hidden or confined Discharge.

In the generality of cases of otorrhœa the discharge is sufficiently apparent; but we now and then meet with cases where patients suffer from purulent formation covering the exterior of the membrana tympani, but without any flow from the orifice of the external meatus having hitherto occurred.

In such cases the deeper part of the meatus is commonly found to have acquired more or less of a red tint, of which the membrana tympani may in some degree partake, and for which the acetate of zinc or nitrate of silver solutions are in many cases found to be effectual local applications; but these should never be dropped in, or otherwise applied, until the interior of the canal and the surface of the membrana tympani have been carefully cleared from discharge, and thus prepared for the beneficial action of the remedy.

In several cases of deafness which have lately come under my care, the exterior of the membrana tympani has been found moistened by an apparently muco-purulent secretion, although discharge was not known to have presented itself externally. With the aid of a little general treatment suited to the indications of each case, and accompanied by the employment of one or other of the local remedies alluded to, the normal condition of the external meatus has been restored, and the hearing soon regained.

The morbid state here noticed is occasionally met with in the ears of scrofulous children, and will then, along with suitable local remedies, require the aid of

tonics, and general treatment suited to the constitutional condition of the patient.

In some rare instances of purulent collection within the meatus, we have at the same time stricture of the external orifice of this canal, or of a part of the cartilaginous portion of the tube very near to this orifice. In such cases the matter becomes pent up within the aural conduit, and gives rise to very great suffering — the patient often complaining of something moving about in the ear, and thus causing great pain, as well as loss of hearing ; this occurred to a young woman of twenty-two, who lately came under my notice : a closed, although not a sealed, state of the external orifice of the meatus was met with ; the aperture was not at all patent, or apparent ; nevertheless, it was found that a grooved probe could be passed into the canal, whence purulent matter was immediately seen to ooze, and its discharge was followed by very great relief to the patient.

Cases of this kind are often very obstinate ; they may be associated with the scrofulous constitution, and have their origin not unfrequently in cutaneous affections of the external ear, for which general treatment is sometimes even of more importance than local

applications; so that, while soothing remedies are applied to the part affected, alteratives, with chalybeate and other tonics, as well as the vapour bath, and change of air, should not be lost sight of.

In the case of stricture of the orifice of the meatus just noticed, "the affection," says the patient, "came on after ulceration of the part had occurred during confinement to bed from typhus fever;" the closure of the aural conduit seemed to be effected mainly by a thickening of the skin at its lowest part, in connection with which a sort of indurated mass, of the size of a horse-bean, is found; the patient states that a surgical operation has already been performed, with a view to the relief of the constricted orifice, but it has not been followed by any beneficial result.

Otorrhœa in New-born Children.

The operation, if so it may be called, of cleansing the surface of the body in new-born children requires to be practised with some care; from the fact of its being too long delayed, as well as from its careless or imperfect performance, two important organs of

sense—the eye, or the ear—may suffer; the latter, it is true, commonly escapes—thanks to the wise provisions of nature, but the organisation of the former is but too often and seriously damaged. If the concha and the outer part of the meatus be not well cleared of the secretion which is found on the surface of the body in the new-born child, a temporary and partial agglutination of the sides of the meatus may take place, this occurrence being somewhat favoured by the anatomical condition of the walls of the canal in new-born children; soft and yielding at this early period, the fibro-cartilaginous tube leading to the membrana tympani lies close upon the bone, not starting outward, and away from it, as in after life it is found to do; so that a very little pressure from articles of dress is sufficient in some measure to approximate the yielding sides of the external canal of the ear, the bony part of which is not yet developed.

If offending matter be left in the canal, so as to produce irritation by its presence, or agglutination of the sides of the passage through its medium, inflammation of the lining of the meatus will, in some cases, follow very soon; the external ear, as well as the integument in the aural region, may assume more

or less of a roseate hue; matter, ere long, trickles from the meatus into the concha; the aural passage is found to be filled with the products of morbid action; and the membrana tympani, if a sight of it can be obtained, is generally found in a more or less opaque state if the disturbances alluded to have existed sufficiently long. The general health of the child being attended to, and the meatus frequently cleansed with lukewarm milk and water, and afterwards carefully dried, improvement, in many cases, will soon follow, and its occurrence, in some instances, may be assisted by dropping an acetate of zinc lotion into the meatus after it has been previously cleaned and dried, to which, if the case seem at all obstinate, a little counter-irritation may be added—which is easily produced to the desired extent by touching the back of the auricle, or the integument covering the mastoid process, with a pencil of nitrate of silver. Such means commonly suffice for removing the inflammatory action, and checking the accompanying otorrhœa which we meet with in very early infancy; and it is of some importance that this form of aural disease should not be neglected, or allowed to continue unchecked, otherwise the membrana tympani may suffer from

thickening, induration, and opacity, to say nothing of the possible occurrence of more serious changes in the tympanum or labyrinth, or of the extreme delicacy of the structures of the internal ear at this period of life, a little disturbance of which may be followed by one of the greatest misfortunes associated with the auditory organ — that of deaf-mutism.

In some rare instances the otorrhœa of new-born children appears to be associated with conditions or accidents attending parturition, amongst which may be mentioned gonorrhœal affections of the mother, and the results of instrumental midwifery in cases of difficult labour.

Otorrhœa in the Aged.

In persons far advanced in life we now and then find otorrhœa occurring, and this, perhaps, on both sides, and without any very obvious cause; the discharge in such cases commonly consists of a thin white or yellow matter, the quantity of which is generally small. On examining the meatus and membra tympani with the aid of the speculum and a good light, the traces of chronic inflammatory action

are, in most cases, immediately found ; the membrana tympani is opaque, and perhaps very white, and thus contrasts well with the neighbouring part of the meatus, which is often quite red ; the calibre of the external canal in such instances not unfrequently appears larger than natural, and without any appearance of ceruminous secretion.

It now and then happens that the changes alluded to are said to have occurred along with some ordinary catarrhal affection, or to have followed on the subsidence of such an attack. In many such cases the accompanying deafness is great ; and it is worthy of notice that if the diseased conditions above mentioned be allowed to continue long, without due attention being paid to them, and the requisite remedial measures employed, the hearing will often be permanently damaged, for it is easily understood that the anatomical alterations in the membrana tympani, the mucous lining of the tympanum, and other parts, which under such circumstances may occur, will be imperfectly, or scarcely at all, repaired, in patients whose vital energies are so much on the wane, and whose reparative powers are consequently so feeble.

In aged people amongst the poor, attacks of otorrhœa of the kind now contemplated frequently occur, and, in many instances, want of cleanliness appears to be the main cause. In bald-headed men with a large and wide meatus the entrance of dust to the neighbourhood of the membrana tympani is very easy; and, at the same time, there is often a want of ceruminous secretion, instead of which we find the dry scaly coating of the meatus broken up, and carried more or less to the bottom of the canal, so that a source of irritation exists on the exterior of the membrana tympani, to which another may be added by the occurrence of catarrhal affection attacking the lining of the tympanic cavity; slight deafness may have been caused by the state of parts on the exterior of the membrana tympani, but this is much increased if catarrhal complaints extend to or attack the middle ear. In old people living in damp and narrow streets in large towns, wanting the advantages of good atmosphere, good ventilation, and good light—to say nothing of poor diet and insufficient clothing, or inadequate exercise—such illustrations of the origin of deafness may often be met with.

Two cases of this kind have just come under my

notice, in aged women—one of 64 and the other of 67 years. In the first case the patient was very deaf, and stated that she had been so during the last two months. On looking into the meatus a little purulent secretion was seen coating the membrane of the drum, as well as the neighbouring part of the canal; this being washed away, opacity of the membrana tympani and chronic inflammation of the deeper part of the meatus were next observed; the tympanum could be inflated, and the entrance of air was heard with the otoscope; the two ears were very nearly in the same condition.

Frequent washing of the external meatus with a decoction of oak bark, aided by the instillation of a weak solution of nitrate of silver, sufficed for restoring the lining of the aural conduit to its normal condition; after which the opacity of the membrana tympani remained, but the otorrhœa was completely cured, and the hearing considerably improved.

In the second case, or that of the aged female of 67, a similar affection of the membrana tympani and external meatus prevailed, but along with this a serious and malignant form of disease which had arisen in the cavities of the nose on the right side,

and which was pressing onwards towards the pharynx in one direction, and towards the cheek in the other, rendered the external complaint of the ear a matter of relatively little importance.

In this case the fungoid disease of the nose is evidently pressing upon the orifice of the Eustachian tube on the affected side; the deafness on this side is great, but the formidable disease which threatens soon to terminate the painful existence of the sufferer renders interference with the aural affection of less importance than is the employment of such means as are most likely to lessen the pain and distress associated with the nasal malady.

Cephalic or Cerebral Otorrhœa.

In the cases of otorrhœa previously noticed, the aural discharge has commonly been derived from parts within the external meatus, from those within the tympanum and its appendages, or from more than one of these sources at the same time; there is, however, another class of cases of "otorrhœa," of a very serious kind, in which a diseased condition of

the cranium, or of its investing membranes, or of some of the parts contained within its cavity, prevails ; and in such a state of things, the purulent matter, sanguineous, or other fluid product of the disease, may pass outwards by way of the auditory apparatus, and this in various routes — frequently through the tympanum, the ruptured membrana tympani, and the external meatus, now and then by way of openings produced by disease affecting the temporal bone, in or near to the mastoid process, and sometimes, although rarely, by way of the Eustachian tube.

In such cases it is desirable, if possible, to ascertain precisely how and where the disease began, whether in the proper structures of the ear, in the cranium or its membranes, or in some of its contained parts, and what the nature and character of the onward progress may have been.

In some cases where otorrhœa exists, independent cerebral affections may occur ; and, at such times, the otorrhœa may be increased by virtue of increase of irritation in the aural region or neighbouring parts ; but, on the other hand, it may happen that the cerebral affection is associated with a morbid process of active tendency, towards which the main part of

the mischief seems to be transferred, and thus the otorrhœa may disappear, giving place, as it were, to the more serious disease of the head, the dire character of which soon becomes obvious.

During the progress of disease in the cranium, of meningeal or cerebral affections, otorrhœa, which did not previously exist, occasionally occurs, and, in such circumstances, its suppression should generally be postponed—the chief consideration being the relief of the head affection, the occurrence of which is here supposed to have preceded the aural malady, and to be allied to it by the sympathy of *neighbouring* parts, rather than by the anatomical connection of those in *juxtaposition*.

The children of the poor not unfrequently suffer from fatal forms of disease in which the auditory apparatus is mainly affected, but where the cranium and its membranes, as well as the brain—to say nothing of the nose, palate, and throat, or of various important structures in the neck—may be more or less involved. These attacks often follow febrile diseases, accompanied by some form of cutaneous eruption, such as small-pox, chicken-pox, measles, or scarlet fever, as well as some other affections of the skin,

in connection with which the febrile phenomena may have been slight, or their type not very well defined. In many of these instances the aural and head affection only assume a grave aspect after the acute symptoms connected with the primary disease have long since passed away. In such cases the disturbance of the nervous centres may be extreme; fearful, and frequently repeated convulsions may occur, associated with cerebral congestion, and this even before the disorganisation within the cranium has made any very considerable progress.

Two cases of this kind have lately come under my notice, one in a young man of twenty-two, the other in a girl seven years of age.

In the first case there was otorrhœa on the right side, swelling and redness of the soft parts in the aural region, caries of the walls of the tympanum, great pain in the head, accompanied by sensation of weight, a tottering and uncertain gait, with loss of hearing on the side affected, and, along with all these distressing head and aural symptoms, a very marked difficulty of breathing, evidently depending on disturbance of the nervous centres, and not accounted for by any appreciable phenomena which could be

reached by physical diagnosis. Left side hæmiplegia occurred, and the patient died on the fifth day after he came under my notice, although he had at first walked to the Ear Institution from a distance of about a quarter of a mile, with a view to obtain relief for the “running” from the ear, when, on account of the serious nature of the affection, and the evidently approaching dissolution, he was requested at once to retire to bed, where he was watched until death put an end to his suffering. *Post-mortem* examination could not be obtained.

The girl of seven suffered from “chicken-pox” at the age of six years; this attack was followed by left side otorrhœa, which had existed about twelve months when the patient came under my notice, deafness on the affected side prevailing all the while. Life was terminated by a severe attack of convulsions; the child was “out of one fit and directly after into another” for the last twenty-four hours of her life.

AUTOPSY.—Two remarkable morbid conditions were met with on *post-mortem* examination, one apparently accounting for the convulsions, the other for the aural symptoms.

HEAD.—On taking off the calvarium the cerebrum

was found to be covered with a thick net-work of large veins distended by black blood, in addition to which the smaller vessels were also found to be in a remarkable state of congestion.

The surface of the spinal chord also displayed a remarkable state of venous congestion.

The brain, cerebellum, and spinal chord were free from any alteration of the nervous substance which the naked eye could detect ; there was no ramollissement, no induration, no tumour, no abscess.

The cerebral ventricles contained a small quantity of transparent fluid ; this did not amount to more than a dram in each. The spinal canal presented no morbid accumulation of fluid.

The aspect of the dura mater lining the base of the skull was not in any way abnormal, so that if the ear affection had not been observed, this membrane might have been passed over without further notice ; that portion of it covering the petrous portion of the temporal bone, of necessity, attracted particular attention, and the finger being carefully passed over the fore part of the bone, near the site of the Gasserian ganglion, it was found that the connection of the bone and the fibrous membrane had been loosened in this

region, and that the dura mater could also be made to sink, by pressure from the finger, into a hollow here felt in the bone, the substance of which had been eaten away (if the expression may be employed) by caries.

EAR.—Nearly every trace of the proper structures of the tympanum, semicircular canals, and cochlea was lost in one dark brown or almost black mass of fetid and carious bone ; the deeper part of the meatus was very narrow ; the *membrana tympani*, as well as the *ossicula*, had entirely disappeared. The auditory nerve, as soon as it dipped into the foramen auditivum internum, became involved in the rotting process that was going on in the parts to which its divisions are distributed ; the *portio dura*, of necessity, sharing the same fate, in connection with which it is worthy of notice that during life there was not any symptom of facial paralysis which had attracted attention.

To cases of otorrhœa in which the discharge is supposed to come more or less from parts beyond the ear, (parts of, or within the cranium,) the name cerebral otorrhœa has been applied, although the appellation *cephalic otorrhœa* might be regarded as more comprehensive, while the names cerebral, cranial, or

cerebro-cranial, would suggest themselves, as suited to those cases in which the diagnosis could be sufficiently established to warrant their special employment.

Otorrhœa. Perforation of the right Membrana Tympani.

Peculiar form of left Membrana Tympani.

March 12, 1856.—Mr. Charles P., æt. 19, a strong young man, has suffered from deafness on the right side during the last nine years. The aural complaint came on after bathing in fresh water, (ponds and brooks,) a frequent summer practice with the patient when a school-boy.

The right membrana tympani is lost; red granulations fill the deep part of the meatus, and occupy the site of the tympanal membrane — apparently sprouting, in part, from the tympanic cavity. At the commencement of the malady otorrhœa was noticed before the deafness came on, and during the last nine years this otorrhœa has prevailed. The patient says that the aural discharge occasionally stops, and that this occurrence is commonly followed by a feeling of fulness in the head, accompanied by tinnitus, and increased deafness.

Air is blown by way of the Eustachian tube to the external meatus, so as to bubble freely through fluid previously poured into this latter conduit.

The uvula is enlarged, flabby-looking, and red, and the soft palate, generally, is in corresponding condition.

The audition is not good on either side; on the left side, or that affected by otorrhœa, the watch must touch the ear before its tick is perceived; and on the right side, where the hearing is not complained of, the tick of the watch is heard only when it is brought within an inch of the auricle. The patient suffers a little from stammering, but this defect is said to have prevailed before the deafness came on.

March 22.—By frequent clearing and drying of the external meatus, followed by the instillation of a weak solution of nitrate of silver, the fleshy growth seen at the bottom of the canal has acquired an improved appearance; its size is diminished, and, as far as such conditions can be determined with the aid of the speculum, its mass looks firmer than before; the fungoid, or sprouting appearance, having given way to a more healthy-looking surface, so that a greater amount of improvement in the state of the tympanum and neighbouring parts may ere long be expected.

The patient states that his hearing is much better than before, and this is easily observed by any one engaged in conversation with him.

The discharge from the ear, which had continued so many years, has ceased, and in connection with this favourable change it is worthy of notice that the frequent ablution of the meatus, and the subsequent and careful drying of this canal, seem to have helped forward the improvement which has taken place ; and at the same time, it may be stated that in many cases of otorrhœa the neglected state of the external meatus, but more especially of the deeper part of it, tends very much to increase the morbid condition which prevails.

In cases of this kind, where the membrane of the drum is perforated, or lost, the greatest attention ought to be paid to the state of the meatus, with the view of preventing additional injury to the tympanum, which may occur either from the presence of irritating matters in the meatus, or tympanic cavity, or from undue exposure of the tender ear to varying atmospheric influences.

In the opposite, or healthy ear, the membrana tympani presents, in its lower third, a crescentic fold,

with the concavity looking upwards, and projecting considerably to the exterior of the general plane of the membrane above ; the arrangement and relative position of the two portions of this bent membrane are such that the lower third, with its projecting crescent, shadows a portion of the other part of the membrane from the light, and thus gives rise to an appearance which might have suggested the idea that part of the membrane was wanting ; such an error, however, is easily avoided by the careful use of the speculum.

Deafness.

Loss of Membrana Tympani. Hæmorrhage within the Tympanum.

J. H., æt. 15, a strong, fair-complexioned boy, has been deaf on the right side during the last six years ; the tick of the watch on this side cannot be heard at a distance of more than an inch from the ear, while on the opposite side it is distinctly heard when held half-a-yard from the head. The malady is attributed by the friends of the patient to cold, caught in bathing.

The patient is constantly troubled with otorrhœa on the deaf side, but the discharge has recently stopped, and it was found that the deafness became greater when the dry state of the ear came on.

On examination, the deeper part of the external meatus is found to be much narrowed, and plugged at the bottom by a white mass, in appearance not unlike cream cheese ; the patient being directed to blow into the tympanum from the Eustachian tube, with the mouth and nose well closed, the white mass at the bottom of the meatus was dislodged ; fluid muco-purulent matter followed, mixed with some small clots of blood, and soon after, when the patient was blowing a second time, fluid blood in considerable quantity passed from the tympanum into the external meatus.

The haemorrhage was arrested by the employment of a little lukewarm water containing a small quantity of sulphate of copper, and the tympanum and meatus being freed, as much as possible, from all obstructing material, the hearing was at once very much improved.

In cases of this kind, where the lining membrane of the tympanum, as well as that of the deeper part of the meatus, is altered by long continued morbid

action, and where a sort of haemorrhagic condition prevails, it is easily understood how the otorrhœa may be occasionally, and even suddenly stopped, by the formation of sanguineous clots, with or without the aid of other concrete material.

In this case two leeches were applied in front of the affected ear, a warm decoction of oak bark was employed three times a day as an injection for the meatus and tympanic cavity, and, after ten days, a weak solution of nitrate of silver was dropped into the ear night and morning, and during the whole treatment a small blistered surface over the mastoid process, of about the size of a shilling, was constantly kept open.

At the end of three months after the commencement of the treatment the otorrhœa had not appeared for more than a month; the deeper part of the meatus was widened by thinning of its lining membrane, but even yet, a complete view of the site or remains of the membrana tympani could not be obtained.

The hearing of this patient was not benefited by any artificial substitute for the membrana tympani.

Otorrhœa. Perforation of the Membrana Tympani. Deafness much increased after Parturition.

Cases have been already recorded in which deafness had occurred apparently as a consequence of changes which took place during or soon after the parturient process, and others in which deafness, previously existing, had been increased under similar circumstances. The following case of otorrhœa belongs, in part, to this class, and appears to possess some features of interest.

March 27, 1856.—Mrs. H. is 37 years of age, and has borne four children; her general health is good, but from a very early period of life her hearing has been defective, and her voice, in consequence, has become somewhat modified.

With the aid of the speculum the membrana tympani on the left side is found to be opaque, on the right side it is altogether wanting.

The external meatus and the Eustachian tube are in normal condition on both sides. The left tympanum is inflated easily from the pharynx, and on the right side the perflation of the auditory apparatus from the throat to the exterior is quite easy, air rushing through

the speculum held in the ear, and bedewing it with the accompanying vapour.

There are two points of especial value in connection with this case; first, the mode of origin of the aural disease; secondly, the circumstances under which the deafness has been more than once increased.

When about ten years of age, the patient had an attack of typhus fever, and it was at this time that disease of the ear first occurred, and, although the history of the affection is somewhat imperfect, there is good reason to believe that myringitis took place at the time when the patient suffered from typhus, and that the destruction of the membrana tympani was a consequence of this attack.

At page 41 of this volume allusion has already been made to the importance of a pains-taking observation, and treatment of aural disease occurring in connection with fever, so that the suggestion there offered need not be repeated.

It may also be remarked that notice has been previously taken of the diminution of hearing which, now and then, comes on at the period of parturition, and of the fact that such alterations of audition may occur in connection with inflammatory disturbance

affecting more especially the mucous membrane of the auditory apparatus, to say nothing here of other sources of deafness at such times.

In the case now reported, the increased deafness which, more than once, followed on childbirth, appears to have come on, not in connection with any inflammatory affection of the auditory organ, but as an association of an over-tried or exhausted state of the nervous system at one time, and after a severe attack of uterine haemorrhage at another, so that in the latter case, instead of any hyperæmic condition of the ear, an anæmic state of the circulatory apparatus requires to be considered, along with the varied effects which such a state is capable of producing upon the nervous system in its central and peripheric divisions, but more especially upon the organs of sense, and particularly upon one of these organs — the ear.

Otorrhœa in the Deaf and Dumb.

In institutions for the deaf and dumb we meet with one class of patients in whom the organ of hearing is not found to betray any signs of abnormal formation,

organic lesion, or morbid change ; in many of these the deafness has been congenital, and the dumbness inevitable ; these patients commonly form a considerable proportion of the inmates of such establishments, and their cases rarely lend themselves to surgical treatment with any prospect of great benefit to hearing.

Mixed, however, with the class alluded to above we find another group of sufferers, in whom various anatomical alterations of the organ of hearing may be met with, such as narrowing of the meatus, fleshy growths, or polypus within this canal, perforation or loss of the membrana tympani, morbid condition of the lining of the tympanic cavity, accompanied, or not, by partial or complete loss of the ossicula, to say nothing of affections of the Eustachian tube, or of lesions of the internal ear, in some cases, doubtless, associated with the diseased conditions just named, but not capable of being brought within the reach of physical diagnosis.

In these cases otorrhœa, as will be easily understood, is often met with ; such patients, without being born deaf, have often acquired their deafness at a very early period of life, before the practice of articulation commenced, or when speech was yet in its

eradicle, so that the hearing being lost, the sufferer is soon deprived of that small portion of his mother tongue which he had previously been able to employ. The aural affection may have been preceded by external injury, by some severe catarrhal complaint, by fever, small-pox, scarlatina, measles, chicken-pox, vaccine disease, eczema, porrigo, hydrocephalus, fits, or other complaints affecting the nervous centres, now and then accompanied, or followed, by disease of the pharynx, of the ear, or of both ; and it is easily understood how, in connection with such maladies, otorrhœa may arise, and may afterwards be of long duration, unless great care be taken to remove the morbid condition of the parts from which the discharge proceeds.

It may be remarked that these two classes of patients in deaf and dumb institutions require to be separated, if the practitioner to whom they are entrusted is to have any chance of doing good to patients of the latter class, who are now and then capable of receiving more or less benefit from surgical treatment.

Of the great importance of treatment, and more especially of early treatment, in cases of otorrhœa of this kind, an illustration has been previously given

(page 64) in the notice of a case of deaf-mutism following scarlatina, in a little girl seven years of age, who fortunately regained both hearing and speech.

The cases of otorrhœa just noticed are those in which the aural discharge is generally a consequence or association of the morbid condition upon which the deafness or deaf-mutism depends ; it is well, however, to bear in mind that there is another group of cases of otorrhœa, as now and then observed in connection with deaf-dumbness, which should be carefully distinguished from the former.

These are cases of otorrhœa occurring amongst patients belonging to the first class mentioned in connection with deaf and dumb institutions, or those whose deafness has been apparently congenital, and in whose organ of hearing no anatomical lesion could be observed before the otorrhœa came on, and such otorrhœa may, of course, arise from any of the ordinary causes of this malady. A few months ago a deaf and dumb boy, three years of age, was brought to me, and on careful examination it was found that every part of the auditory organ capable of examination with the aid of the speculum was in perfectly normal condition ; the external meatus was in a perfectly healthy state, and

the membrana tympani equally free from any trace of morbid change. In such a case it was evidently not desirable to recommend any medical or surgical treatment. In about two months after this first observation and study of the case the little patient was again brought to me, suffering from otorrhœa on both sides ; the purulent discharge evidently arose mainly from the lining of the external meatus, which was swollen and red, while the membrana tympani had acquired somewhat of an opaque aspect on both sides. By careful clearing of the canal, followed by the occasional instillation of an alum lotion, the otorrhœa was subdued, and the parts subsequently regained, in a gradual manner, their previous and normal appearance.

If this patient had been first seen when the otorrhœa already prevailed, it might possibly have been supposed, at first sight, that the discharge was associated with some form of aural malady upon which the deafness depended ; such an error might not have suggested any injurious treatment, but, viewed pathologically, it would have been a great mistake.

In another deaf and dumb boy, of nearly the same age, otorrhœa had existed during more than two years, so that the question as to whether the deafness was

congenital in this case, or whether it came on as an association of the malady which produced the otorrhœa, was not so readily settled.

Before closing these observations relating to otorrhœa, it may be well to mention that there is one peculiar, yet apparently very simple source of error, in the accounts often given of the origin and progress of aural discharges in children.

Every one knows that ulceration at the back of the ear is not uncommon in infancy, and that discharge (in some instances long continued) may flow from the tender surface at the back of the auricle, and from the neighbouring part of the head, as well as from the intervening tegumentary fold; and it must be borne in mind that, in many of the vague histories of discharge from the ear given by parents and friends, this oozing of purulent matter from the hinder part of the organ is spoken of in such manner as might lead the practitioner, unless he were sufficiently on his guard, to suppose that the story related to a flow of matter from the external meatus, with which, of course, it should not be confounded.

Polypus, and Otorrhœa associated with Polypus, or with fleshy growths within the Ear.

The name polypus, as applied to certain morbid growths in the ear, is literally very incorrect; this, however, is no great evil, but the manner in which the appellation is employed, on the one hand, for growths arising from the surface of the meatus, without previous ulceration or loss of substance in this tube, and, on the other, for fleshy excrencences or granulations starting originally from diseased surfaces which previously existing complaints have produced, is a mode of confounding morbid conditions which might fairly be regarded as essentially different.

Cauliflower, or other fleshy excrencee growing from the os uteri, or its neighbourhood, is not called polypus—a name reserved, as is well known, in this part of pathology for a more defined and very different tumour; but if a fungoid-looking mass sprout out from a diseased and ulcerated tympanum, pushing its way into the meatus through the perforated membrana tympani, it is commonly enough called a polypus of the ear; and a smooth and rounded tumour, varying in bulk from the size of a small pea to that of a

cherry, growing most frequently from the lining membrane of the meatus, and having no ulcerated surface connected with it, often receives the same name: this want of adequate distinction in nomenclature is not without evil influence on practice; for, if the smooth and rounded tumour alluded to be diagnosed as polypus, such diagnosis may be very complete—it may suggest the operation for removal of the mass, and this may suffice for the cure; but, if we look into an ear which has long been diseased, where perhaps the membrana tympani is in great measure destroyed, and where the peripheric remains of it are covered by red and fungoid looking granulations arising from the diseased surfaces of the tympanum, meatus, or both, and content ourselves by saying that this is polypus of the ear, with the supposition, that, in its nature, or in the treatment it requires, it is at all like the disease previously mentioned, this, in a practical point of view, will be a serious mistake; for, in many such cases, that which is called the polypus is merely one exterior sign or index of the deeper and more important disease which is hidden in the tympanum or neighbouring parts of the auditory apparatus, and which, we need not say, cannot be extracted with forceps. The name polypus

might be used for either form of disease, but it ought certainly not to be applied in an unqualified manner to both, any more than we ought to call polypus nasi, and granulations rising around the margin of a perforation of the septum nasi, caused, perhaps, by syphilis, by one and the same name. We need not here allude to the subdivisions or classifications of polypi of the ear; but it may just be stated that the true aural polypus presents certain varieties which in practice, and previous to extraction, are distinguished mainly by their different forms, position, mode of attachment, and degrees of consistence, some being so soft that they might be spoken of as gelatinous, others firm enough to be regarded as fibrous.

With a view to practical convenience, cases of otorrhœa might be divided into two classes:—first, those in which the aural discharge flows from surfaces of which the vital condition is changed by morbid action, but without the formation of new or parasitic growths; and secondly, those cases of otorrhœa in which the discharge is associated with the presence of morbid growth in the meatus, tympanum, or both. It might be said that the morbid growth and the otorrhœa may be independent each of the other; this

statement, however, would be so seldom true that the balance of the argument will be scarcely moved by taking its weight away.

If the above were regarded as a convenient primary division of otorrhœa, the subdivision, most useful in practice, might be derived from the meatus, membrana tympani, the tympanum and its appendages, as the affection might be more or less associated with one or more of these parts. In connection with polypus and otorrhœa, it may well be repeated that the state of the general health, but especially all that relates to the tubercular diathesis, or any serious condition of cachexia, cannot be too constantly borne in mind; to which we may add that polypoid or fleshy growths in the ear are very rarely met with, saving in cases where the general health has been previously deranged, or where the patient has suffered from some form of disease in the auditory apparatus.

Otorrhœa cured by removal of Tumour from Left Meatus.

October 5, 1853.—W. G., æt. 9½ years, a strong boy, with dark eyes and corresponding complexion, had

measles five years ago ; the attack was mild, and was soon recovered from, leaving him, however, a little “deaf of both ears ;” his mother says “some days he is very deaf, so that we have quite to storm at him to make him hear, and his deafness is worst in dry weather, but in damp weather he can hear a great deal better, and there is a greater discharge from his ears at the same time.”

Otorrhœa on both sides has prevailed ever since the attack of measles ; the discharge is very offensive, and very profuse in the night, so that the night-cap in the morning is found saturated with it, more especially on the left side ; and often when he returns from school in the evening, the shoulder part of his jacket on the left side is covered with the dropping of the aural discharge.

About five weeks ago a growth in the left side meatus was observed by his mother, who looked into the ear in consequence of hearing the child say that he had a pea in it, and could “feel it rattle.”

This is one of those tumours of the meatus to which the name polypus is commonly given, and if we do not attend to the literal value of the expression, this name is as good as any other ; but as in most cases the

growth has only *one* attachment, it would be awkward to regard it as having *many* feet. The tumour is one of the largest of the kind, projecting, in form, like a cherry, from the meatus into the concha, not rosy, however, in colour, but of a slightly livid appearance, as if its circulation were hindered by a partial strangulation at the orifice of the meatus; at first sight it was clean and dry on the external surface or visible part; when, however, its soft structure was a little compressed, a way was made for pus to flow from within, which immediately oozed from the meatus into the concha. With a pair of delicate and well-toothed or serrated forceps, passed gently upon the mass, it was gradually compressed, and thus the instrument was allowed to obtain a deeper hold, when, by gently twisting the growth, it was separated in a clean and complete manner from the lower part of the bony meatus, to which alone it was found attached. Very profuse haemorrhage immediately followed, but this soon stopped; and after it had been quiet for a little while the ear was carefully syringed with tepid water, and next the meatus and membrana tympani examined; the former was found larger than the canal of the opposite side, and on its floor or lower part a red

portion, about the size of a large pea, shewed the surface whence the polypus had been removed.

It is particularly worthy of remark that the membra tympani looked quite healthy, and could be seen to be completely separated and distinct from the part to which the foreign growth had been attached, so that the polypus had no immediate structural connection with the outer surface of the membrane of the drum.

After the removal of growths of this kind from the ear, it is well to clean out the meatus by gentle syringing with a little tepid water, as soon as the bleeding begins to subside, for this practice not only prevents the detention of clots of blood in the canal, which might be the cause of future deafness, either from the size of their unaltered mass or from vessels belonging to the newly abraded surface, or that from which the polypus has been separated, shooting into the adherent fibrin which might connect itself with the raw surface now formed.

As may be easily supposed, the removal of the tumour somewhat improved the hearing, but the otorrhœa remains to be considered.

October 8.—There is now no discharge from the meatus whence the polypus was extracted, and from

the other the flow has been so diminished that the inner surface of the passage at present is but barely moistened by it. A weak solution of nitrate of silver has been dropped into the ears.

October 11.—Discharge on both sides has ceased.

November 19.—Hearing is very much improved.

November 26.—Hearing further improved; no return of otorrhœa; the part from whence the polypus was removed is now smooth and healthy-looking.

In this case the removal of the morbid growth on one side, with ordinary attention to the meatus, sufficed for the complete removal of the otorrhœa on both sides.

Polypus in both Ears.

May 24, 1854.—Sarah Ellen K., æt. 14, has been deaf during the last five years. A polypus is seen filling the right meatus, and projecting into the concha; the mass is of the size of an ordinary cherry, turgid with blood, and of livid colour; otorrhœa prevails, by which the surface of the tumour is kept in a moistened state.

The above description is equally applicable to the state of the corresponding parts on the left side.

With a pair of small dressing forceps the right polypus was easily and completely extracted, and considerable improvement in hearing followed the operation. The texture of the polypus on the left side was less firm, and it could not be removed entire; it was brought away in pieces, and the hearing, although better for the operation, was less improved than on the right side.

June 24.—Within the last month a solution of nitrate of silver, ten grains to the ounce, has been dropped into both ears three times a day; hitherto there is no appearance of a return of the polypoid growth; the discharge has gradually subsided, and the improvement in hearing which was at once effected by the removal of the tumours has gradually increased since the time of the operations.

Tumours of this kind require very cautious treatment; the probability of success is much greater when they can be removed entire; for, if broken often, the repeated application of the forceps may prove a source of irritation to the lining membrane of the meatus, if not to the membrana tympani itself, and thus a simple and limited form of disease may be changed for one more complicated and extensive.

Polypus in Right Ear, with accompanying Otorrhœa, cured by removal of the Tumour.

July 3, 1854.—Emma H., æt. 9, has suffered from otorrhœa on the right side during the last twelve months; the discharge occurred without any apparent cause; it now and then ceases for three or four days, when severe pain is felt in the ear, this continues two or three days, when, the discharge returning, the pain vanishes. Polypus is now seen projecting from the outer end of the meatus; this was not observed until about a week ago.

The patient suffers from a tender state of the tarsal margins, and her general aspect betrays something of a delicate, or strumous organisation, in connection with which aural polypus is not unfrequently found. The polypus was removed with the forceps; drops with nitrate of silver afterwards employed, the meatus from time to time carefully cleaned, a blister applied behind the ear, and kept open for a fortnight, an occasional dose of rhubarb with mercury and chalk being given: this plan of treatment sufficed for the cure of the aural disease.

In this case the polypus was attached to the hinder

wall of the meatus, just within its bony portion, by a somewhat narrow pedicle ; the mass itself had expanded on reaching the concha to the size of a small cherry.

Polypus growing from the floor of the Meatus.

November 30, 1854.—Mary N., æt. 24, has a small red incipient polypus, seen in the middle of the left external meatus, and growing upwards from the floor of this canal ; hitherto it produces no inconvenience. During the last twelve months the patient has suffered from a chronic inflammatory affection of the left cervical glands, which has given rise to great tumefaction in front of the sterno-mastoid, and to ulceration at the posterior border of this muscle.

This patient sought relief for the affection of the cervical glands without knowing of the existence of any aural complaint ; in connection with which we may remark that disease of the structures of the neck, more especially in strumous subjects, not unfrequently precedes various morbid states of the ear, the incipient stages of which it is always of importance to observe. When the audition of the two ears was compared, with

the aid of the watch, it was found that the hearing on the side affected by polypus was already very much injured; on the sound side the tick of the watch held one yard from the ear was distinctly heard, while on the opposite side, where the meatus was partly closed by the presence of the polypus, the watch could only be heard when within a hand-breadth of the ear.

Such facts tend to shew how little patients frequently know of the earlier stages of deafness, or of the aural maladies on which they depend, more especially in those instances where slow and insidious changes in the auditory apparatus have originated and progressed without pain or inconvenience.

Polypus. Otorrhœa.

June 1, 1854.—Eliza T., æt. 12, has been extremely deaf on the right side during the last four years. A little more than four years ago she suffered from serofulous ulcers on the right side of the neck, which healed up about this time, after continuing to discharge during about five years; these sores came

on after an attack of measles from which the patient suffered when three years old. As a young child, the patient enjoyed perfect health until the attack of measles came on, which was followed by the scrofulous disease of the glands of the neck, afterwards, of five years' duration.

In the right ear a polypus is seen to fill up the orifice of the external meatus; this growth was removed with the forceps; it was tolerably firm, rounded, and smooth, and its pedicle, which was small, was connected with the floor or lower part of the meatus about the middle of the bony portion of this tube.

The surface whence the growth was torn was afterwards treated with the nitrate of silver. Slight otorrhœa prevailed, but the removal of the tumour, with the subsequent treatment above alluded to, were found sufficient for its cure.

In this instance the occurrence of the aural disease (according to the account given) after the healing of the ulcers in the neck is worthy of notice; but it may be well to remark that, as in the last case, the aural malady may have existed for some time, unfelt or unheeded, while the state of the neck attracted more particular attention.

Deafness. Polypus. Otorrhœa.

September 30, 1853.—Wm. H. N., æt. $6\frac{1}{2}$, was found to be deaf with both ears about two years ago, and soon after a discharge from the right ear was observed; this has ceased, and discharge from the left ear now prevails. In this ear a polypus, or rather fleshy excrescence, is seen growing from the tympanal end and lower part, or floor, of the meatus externus; from the surface of this excrescence the discharge oozes. In the right ear a hard and large plug of cerumen blocks up the deeper part of the external canal, so that, in this case, we have two distinct causes of deafness, one of which, the ceruminous accumulation, is at once removed.

This case was from time to time observed during two months after the above observations were made, a solution of nitrate of silver being dropped into the left meatus once a day, citrate of iron and quinine being the while given internally.

The unpleasant fœtor of the discharge was corrected by the occasional injection of a little warm water containing a few drops of creosote.

This treatment was followed by diminution of the

otorrhœa, and by improvement in the hearing, so that the parents of the little boy thought further treatment unnecessary—a mistake, however, by no means small. In cases of this kind the fleshy-looking growth from the interior of the meatus should not be confounded with true polypus; the latter is often attached by a small pedicle, and is capable of removal with the prospect of complete cure and subsequent healthy condition of the parts affected, while the fleshy excrescences are commonly broadest at their attached surface, and generally incapable of any complete removal by silken ligature, loops of hair, or wire, forceps, or such like means, so that we are compelled to attack their free surface by detergents, styptics, and escharotics, while the requisite attention is paid to the improvement and preservation of the general health, the surfaces within the meatus being at all times kept as free as possible from irritating matter arising from the morbid products which tend to accumulate.

It is worthy of notice that patients who suffer from this form of disease in the depth of the meatus are often in a condition which should be regarded as very unsafe, inasmuch as important changes now and then take place in connection with the tender and diseased

meatus, and as the sufferers are commonly young children, such changes too often pass unheeded, for days, or even weeks, until their effects are manifested externally by phlegmonous inflammation shewing itself in the aural and mastoid regions, which, of course, calls attention to that which is going on within, when a widely spread otitis, which seems to have arisen in the neighbourhood of the long existing morbid growth, may be found to affect the parts within the tympanum and meatus, perhaps also the Eustachian tube, as well as the periosteum of the temporal bone and the soft parts around the ear, ending, it may be, in abscess in the mastoid region; while in some instances the purulent collection is pushed forwards and upwards towards the superciliary ridge, as occurred in the case of a boy six years of age, who lately came under my notice, and who had suffered from otorrhœa, with fleshy growth in the bottom of the meatus, for twelve months before the severe attack of otitis, followed by abscess extending from the aural to the superciliary region, came on.

In the little boy, W. H. N., whose case has just been reported, a similar attack of severe otitis, followed by external abscess, which was opened behind the ear, occurred about two and a half years after he first came

under my notice ; he has just recovered from this attack, which has tried his strength most severely, and his parents are now convinced of the importance of a more continued and persevering attention to the state of his ear, and that he will not so easily “grow out of the complaint” as they had previously imagined ; they are now convinced that instead of his *growing out* of the disease the disease was *growing into* him.

The more feeble or cachectic the constitution, the more dangerous are these growths in the depths of the meatus—in other words, the greater is the danger of new morbid action, which may tell in the cerebral, as well as in the aural, and outer direction.

SECTION V.

Affections of the Eustachian Tube.

THE guttural orifice of the Eustachian tube is comparatively large, while its tympanic opening is very small, and hence easily closed by swelling of its lining membrane; either extremity may be covered with polypus, or other tumour; such growths might also affect any intermediate part of the length of the canal, which may also be closed by sanguineous, fibrinous, mucous, or purulent accumulations, as well as by congestion, thickening, or adhesion of its mucous membrane, to say nothing of various combinations of such morbid conditions, or of the effects of emphysema from injury of the lining of the tube, or of the neighbouring part of the respiratory apparatus.

Obstruction of the Eustachian tube from the presence of exfoliated portions of bone, or from that of foreign bodies reaching this canal by way of the nose,

or mouth, or from the stomach in the act of vomiting, in cases where the velum might be wanting, require to be noticed as possible occurrences, which, in practice, are met with so rarely that but very few observations respecting them are to be met with in the treasures of clinical records.

In the following remarks relating to obstructions of the Eustachian tube, it is that which might be called the mechanical condition of this canal which is more especially alluded to in the short account given of the cases annexed ; but it is constantly to be borne in mind that this mechanical condition of closure of the tube is always to be studied in connection with its causes, the most frequent of which are common, or specific diseases, mostly inflammatory, which affect the mucous lining of the canal, and travel to it from the nose, mouth, or throat, by way of its trumpet-shaped or pharyngeal aperture ; hence, diseases that tell upon the throat, whether called catarrhal, inflammatory, or febrile, and whether or no accompanied by any condition of general cachexia, poisoned state of the system, tubercular diathesis, or bad constitution, are commonly found amongst the antecedents of inflammation, induration, ulceration, stricture, or closure of

the Eustachian tube, or of some part of this tube; and it need not be added that the general treatment, in some cases, will require to be especially adapted to the nature of the primary cause of disease which has been previously brought into play.

It is probable that, if the Eustachian tube had opened into the mouth, instead of into the pharynx, it would have suffered more than it does now from inflammatory affections of its lining membrane, to say nothing of the injury to which it would have been constantly exposed from the introduction of particles of food and other foreign bodies. The position of the guttural orifice of the Eustachian tube is a marked proof of the care which nature has taken of the tympanic cavity, and the delicate parts which it contains; and the importance of this secluded or hidden position, if so it may be called, is further shewn by those cases in which, from malformation, or loss of the neighbouring parts, the orifice of the auro-faucial canal is more than naturally exposed; in illustration of this statement we need only mention the deafness now and then observed in connection with morbid states of the nose, mouth, palate, and throat, more especially those diseased conditions in which a want

of parts or of the natural continuity of parts is met with, as in cases of cleft palate, loss of the velum, or loss of any considerable part of the nose.

In inquiries relating to the Eustachian tube and tympanum, the common sensibility of these parts is worthy of especial attention. We occasionally meet with cases of deafness depending upon alterations in the tympanic cavity which have followed inflammation of its lining membrane, where this membrane seems to be in a state of partial anaesthesia, a condition apparently telling upon the loss of hearing which is complained of, and in some rare instances, an opposite state, characterised by abnormal increase of sensibility, either constant, or of occasional, or periodic occurrence, is observed.

A gentleman, æt. 35, who lately came under my notice, is very deaf on the right side; this deafness followed a blow or slap on the right ear, which he received from the open hand of a strong man, when he was fifteen years of age, now twenty years ago; the right membrana tympani is opaque, and the malleus not seen; but the remarkable feature of the case is the want of sensibility in the altered lining of the right tympanum, into which the air easily rushes, and

its ingress is well heard with the otoscope, but it is "very little felt" by the patient when compared with what he feels on the opposite or sound side.

We cannot pay too much attention to the study of the fifth cerebral nerve when occupied with inquiries relating to diseases of the head and face, or to those affecting the organs of sense which are here grouped together; and, as far as our present subject is concerned, we may remark that the normal state of the common sensibility of the ear is essential to perfect audition, as that of the eye is to sight, and that morbid alterations of the sensibility of the lining membrane of the tympanum (which has such important relations to the nerves, bones, muscles, and other structures belonging to the middle ear,) cannot fail to be associated with marked injury to audition.

In investigations respecting the sensibility of the interior of the tympanum, as tried by what we may call the inflation test, we must attend to the condition of the intelligence of the patient, as well as to the state of his information respecting the object of our inquiry, and it is well, if possible, to ascertain the former state of sensibility of the part, or that which prevailed before the morbid condition of the ear was

complained of; if the patient be intelligent, and capable of studying and comparing the different sensations produced by inflation of the drum on the sound and diseased sides, his report of these sensations may be worthy of especial notice.

Deafness of Five Years' duration. Obstruction of Left Eustachian Tube. Concavity of Tympanal Membranes.

October 3, 1855.—Mr. Henry B., æt. 21, a healthy and strong young man, of dark complexion, has been deaf during the last five years; the loss of hearing followed the practice of bathing in “brick-ponds,” when the patient very often immersed himself completely under the water; at such times he says that he felt the water enter his ears “from the throat, as well as from the outside,” and that on leaving the pond he used to try to get rid of the water from his ears, but was not able to do so.

About three weeks after the practice of bathing was left off, otorrhœa commenced on both sides; the discharge continued during two months, and then stopped spontaneously, and, as the patient says, suddenly; “so long as this running continued there was no deafness,” but the hearing became very defective

immediately after the disappearance of the otorrhœa ; this deafness has ever since continued, and in addition, about ten months ago, tinnitus occurred, affecting both ears, but being most troublesome on the left side. The mucous membrane of the pharynx is rough, red, and thickened by chronic morbid action. With the otoscope the entrance of air to the tympanum is distinctly heard on the right side, but cannot be heard on the left. On both sides the membrana tympani is slightly opaque, but the most striking objective feature of the case, is, the more than usual, and remarkable concavity, of this membrane, towards the meatus, on both sides.

Atmospheric air was injected, through the Eustachian catheter, into the left tympanum, by, and after which, it was found that the obstruction of the Eustachian tube was overcome ; for, on applying the otoscope, and directing the patient to make a forcible effort of expiration, with the mouth and nose closed, as before, the air was distinctly heard to enter the tympanic cavity, and immediately after this the hearing was found to be improved.

It is probable that a closed state of the Eustachian tube has also existed on the right side at a former

period, and this, which would account for the external concavity of the membrana tympani, has gradually yielded to the vis medicatrix naturæ.

Deafness.

Closure of the Eustachian Tubes.

December 16, 1853.—James D., æt. 34, is a carter, and so extremely deaf that he says “I don’t know when the cart stops and when it is going, unless I see it; I can’t hear the wheels at all.” This deafness is of recent occurrence, and seems well accounted for by the statements of the patient; he says, “I ailed nothing a month ago, but then I began to be employed in loading ice, from an American ship, into carts; I helped to lift great blocks of ice with my naked arms, sweating all day long, with the front of my trousers soaked with wet, and drying on my limbs as I went away from my work, in the evening; I soon began to feel a singing in my ears, and I became deafer and deafer every day, until I could not hear people shout, nor the cart as it went along, so that I was afraid to go on carting, lest some accident should happen to me, and I got a job as a porter.”

The mucous membrane of the nose and pharynx is intensely red, the soft palate and uvula much enlarged, the tonsils swollen, and the Eustachian tubes impervious, as found by the application of the otoscope ; this closure of the auro-guttural canal being caused mainly, it is probable, by vascular congestion, and thickening of its lining membrane.

The patient requires to be spoken to in a very loud voice, but the deafness thus observed is not as great as would be supposed from his account of not being able to hear the carts or other noises in the street.

The catheter was passed into the Eustachian tube, and air forced through this canal into the tympanum by means of the elastic instrument of M. Matthieu ; its entrance into the tympanic cavity was distinctly heard with the otoscope, and its loud rattle amid the accumulated mucus which the middle ear contained was equally interesting and satisfactory, for immediately after the catheter was withdrawn the patient's hearing was restored — the operation having been performed on both sides.

Before the catheterism the sufferer was not able to inflate his tympanum on either side, after it this was found practicable on both sides.

The patient being a very strong man, an active antiphlogistic treatment was adopted, of which leeching the interior of the nostrils formed an important, and, apparently, very efficient part; next to this should be mentioned the influence of emetics, of which four were taken—every one of which seemed to do good.

Hæmorrhage into the Eustachian tube, or tympanum, might, in such a case, be caused by injudicious employment of the catheter, the introduction of which should rarely be practised during the inflammatory stage of the affection of the mucous membrane.

In such cases the free employment of calomel and colocynth, aided by the black draught, and followed by low diet, will often do much in the relief of the guttural and aural complaint, but the application of leeches to the interior of the nostrils, and the use of emetics, should not be lost sight of whenever the strength of the patient is suited to such combination of remedies.

In a month after the commencement of the above treatment the patient had completely recovered his hearing; the Eustachian tubes had become quite free, and the state of the meatus and membrana tympani was quite normal on both sides.

Closure of the Eustachian Tubes.

October 13, 1853.—W. G., æt. 46, a strong, healthy-looking man, has been deaf during the last two years. The defect of hearing is such that great effort of voice must be made in addressing him; he states that his hearing was always good until he was employed in the yard of a boiler-maker, in Liverpool, where he was a good deal exposed to the weather, as well as to the terrible Vulcanian noise of boiler-riveting; this “din” affected his ears so much, that, on leaving the yard in the evening, he says, “I was often more than half an hour before I could hear anything at all.”

The membranes of the tympana have their natural aspect; the meatus is clear, dry, and without cerumen. The inflation of the tympanum cannot be heard on either side with the otoscope.

In cases of deafness apparently produced by causes similar to those alluded to above, we often find remarkable opacity of the membrana tympani; such, however, was not the case in this instance. The anatomical changes which had occurred were probably

hidden within the tympanum itself, and in the neighbouring part of the Eustachian tube.

In this case the hearing was benefited by the administration of iodide of potassium, with sarsaparilla, aided by the injection of the Eustachian tubes, first with air and afterwards with a weak solution of nitrate of silver, and the application of blisters to the mastoid region. After this treatment had been continued during one month the entrance of air to the tympanum could be heard on both sides with the otoscope. The patient, meanwhile, had practised the frequent blowing of air from the throat towards the drum of the ear, and this, there was reason to suppose, had been of use.

Patients of this class are peculiarly placed with regard to the chances of injury to the auditory apparatus; by the constant and violent noises the organ of hearing is, of necessity, kept in an abnormal state of excitement; its vascular, as well as its nervous system pushed to the extreme of action, and all this associated with frequent, if not constant, exposure to wind and weather; either cause, alone, is often found sufficient to injure this delicate organ, while the joint operation of the two is but too frequently followed by

a serious amount of damage to the mucous system of the ear and throat, to the function of audition, and the character of the voice.

In those who cannot escape exposure to the above noticed causes of deafness the ear may, to some extent, be protected by side pieces attached to the workman's cap, or by stopping the meatus with small portions of cotton during the busy part of the day.

Obstruction of the Eustachian Tube. Deafness. Restoration of Hearing.

November 16, 1853.—H. W., æt. 34, is a watch finisher, and became deaf of the right ear, about seven years ago; he sat then in a very warm workshop, with his right ear about one yard from the door, through which there was a constant current of cold air.

The tympanum is inflated in a peculiarly free way on the left, or sound side, but its inflation is barely audible on the deaf side. Tinnitus prevails on the right side; the patient compares the noise to that of a distant crowd; but sometimes, when in the street,

he imagines cars are driving upon him—a deception practised, as it were, by the tinnitus, which is very annoying to him.

The patient has attempted to force tobacco smoke from the throat into the ears, and finds it enter the left tympanum freely, but the right not at all. To re-open the course of the Eustachian tube was evidently desirable, and it was determined to adopt means likely to answer this purpose. The patient was recommended forcibly to drive the air towards the affected tympanum three times every day.

A little lukewarm olive oil was thrown into the guttural extremity of the Eustachian tube, every morning, by way of the catheter passed through the nose; this was followed by the injection of a stream of atmospheric air.

After the above combination of mechanical means had been employed during six weeks the patent condition of the Eustachian tube was found to be restored; the patient could blow into the tympanum, and the hearing was very much improved.

Obstruction of the Eustachian Tube.

February 12, 1854.—D. A., æt. 68, a healthy-looking old man, is extremely deaf on the left side, the tick of the watch not being heard on this side, even when closely pressed against the auricle.

The patient says that about two years ago he was put into a damp bed, before which he had no aural complaint; that two or three days after he became deaf on the left side, but without pain in the ear; this deafness continued, but did not attain to its present extreme degree until about three months ago, when the patient “put on a damp jacket,” after which it became much worse, and was now accompanied by ear-ache on the right side, as well as by otorrhœa.

On applying the otoscope the entrance of air to the left drum is not perceived; its ingress to the right tympanum is plainly heard.

The deeper, or bony part of the meatus is narrowed by granulations rising from its lining membrane; these granulations coat the periphery of the membrana tympani, and even the central part of this membrane has entirely lost its natural aspect, being of a dull brownish

red colour. In the mouth and pharynx there appears to be nothing abnormal.

The remedies here obviously indicated were — first, to guard against further injury to the auditory apparatus; in the next place, to subdue the chronic inflammation affecting the meatus, membrana tympani, tympanum, and Eustachian tube. Two leeches were applied to the front of the ear, a blister over the mastoid process, a few alterative doses of blue pill, and afterwards the iodide of potassium with sarsaparilla, were administered; the solution of nitrate of silver being dropped daily into the ear.

The latter part of the treatment was continued during three weeks, and the effects produced in this time were found encouraging; the appearance of the meatus and membrana tympani improved, the central part of the membrane having less of the brownish red appearance than before; the lining of the meatus was also considerably improved, while the morbid narrowing of its calibre was evidently reduced, and, as might be supposed, with these anatomical changes, an improving physiological condition had kept pace — the hearing being considerably increased.

Frequent catheterism of the Eustachian tube was

practised, after which the patient was able to press the air from the throat to the tympanum, with sufficient force to render its ingress audible with the aid of the otoscope on the left or most affected side.

In such cases the closure of the Eustachian tube often depends upon swelling of the mucous membrane at its tympanal extremity, for which a well-timed antiphlogistic and general treatment is often so effectual as to require but little help from nasal catheterism.

Syphilitic Affections of the Eustachian Tube.

Deafness from syphilitic disease of the Eustachian tube and tympanum is now and then brought under the notice of the surgeon; in most cases it admits of relief, in many of complete cure.

It is very important in cases of this kind to determine, if possible, as to whether or no the disease be confined to the mucous system of the ear; if so, it will commonly be relieved; but if, on the other hand, the serous system of the organ, or membranous labyrinth, have suffered, and more especially if the injury to the internal ear be not recent, but of long

standing, then the deafness may be regarded as of a most unfavourable kind, and on this view the prognosis respecting it should be based.

Amaurosis, in some cases, accompanies this serious form of cephosis; such a case has lately come under my care; the diagnosis respecting it was based, in some measure, on negative signs: the patient was a married female of 36; she had been blind from amaurosis two months, and deaf on both sides during one month. Morbid condition could not be found in connection with any part of the external or middle ear: a deep-seated pain in the ear was felt on both sides, accompanied by a sensation of fulness in the head, suggesting the probable existence of disturbance of the fibro-serous membrane within the cranium. Cases to which the term "nervous deafness" has been applied seem occasionally to be of this nature.

Enlarged Tonsils. Obstruction of Eustachian Tubes.

March 12, 1855.—Mr. J. T. H., æt. 20, complains of deafness, and of uneasiness in the throat, with difficulty in respiration, and deglutition, and alteration

of voice. The tonsils are enormously enlarged—of about the size of large walnuts, and nearly touch in the middle line; the inflation of the tympanum is heard faintly on the right side, and not at all on the left.

The enlargement of the left tonsil was removed with the amygdalotome of Fahnstock.

March 29.—Good effects have followed the operation; the hearing, speaking, breathing, and swallowing, are spoken of by the patient as all improved. The guttural space being now sufficiently widened, the removal of the right tonsil need not at present be practised.

In this case there is opacity of the membrana tympani on both sides; this is probably a consequence of former inflammatory affection which has passed from the throat, by way of the Eustachian tube, to the tympanum. Such affections of the mucous membrane of the auditory apparatus may, in some cases, be considerably relieved by the haemorrhage which follows excision of the tonsil.

May 8, 1856.—It is worthy of remark that the patient has never been in the slightest degree troubled by the state of his throat since the time when one

of the tonsils was removed, and it is equally deserving of notice that the opposite tonsil has diminished in size since the projection of its fellow was taken away, and there has since been no new growth on the side where the operation was practised—the surface in the tonsillar region being here sunk, instead of prominent.

With the otoscope, the air is heard to enter the tympanum freely, on both sides, both in the act of swallowing, and in that of forced expiration, when the mouth and nose are closed.

It has appeared to me that excision of the tonsil, or rather, the removal of a portion of an enlarged tonsil, which is the operation really practised, is occasionally useful, viewed in connection with the function of the ear, as well as with that of the throat; in my own practice, however, the cases requiring this treatment have been but few in number. Unfavourable occurrences may follow such an operation, if the cases for its practice be not judiciously selected; one is, a second or new growth of the part operated upon; a patient may have his tonsil “excised,” and in less than twelve months’ time the tumour on the side of the throat may be found prominent, spongy-looking, and as large, if not larger, than before; this seldom

occurs except in patients of strumous constitution, and may in some instances be averted by the employment of the solid nitrate of silver, applied daily for some weeks after the operation, not, however, commencing its application before the patient has recovered from the immediate effects of the cutting instrument.

Morbid conditions of the Eustachian Tube, associated with Cleft-palate, and other Abnormal states of neighbouring parts.

Malformations, or morbid conditions of the nose, mouth, or palate, may interfere with the respiration in such manner as to prevent the due mode of arrival, or the requisite warming of the air on its way to the larynx, or Eustachian tube; and in such cases we frequently find the soft palate, the back of the pharynx, and the mucous membrane lining the trumpet-shaped extremities of the tubes, in a state of chronic irritation; thickening of this membrane has taken place; its surface is often rough, and, not unfrequently, but more especially in cases of cleft-palate, we observe indurated nasal mucus adhering to the posterior wall of the pharynx, and thus tending to keep up, if not to increase, the diseased state of the parts.

In cases of deafness associated with polypus in the nose, these conditions now and then prevail, and may, in favourable instances, be got rid of by the removal of the nasal malady.

In many such cases the affection of the mucous membrane of the fauces has travelled through the Eustachian tube to the tympanum, and manifests itself, visibly, in this part, by its characteristic index—opacity of the membrana tympani; perhaps also by closure of the tympanic portion of the tube, to be determined by the increased concavity of the membrana tympani, or by the negative signs furnished by auscultation, the air not entering the tympanum, either in the act of swallowing, or during forced expiration.

These remarks seem naturally to lead to the notice of cases of deafness associated with defects of the nose, lips, or palate. Of these, the cases of cleft-palate are perhaps the most worthy of consideration. After a short notice of such, in the next place, a few remarks may be offered on certain surgical diseases and injuries of the head and face, which occasionally affect the ear, by acting, in some cases on the external meatus, in others on the Eustachian tube, in others on the tympanum or parts more deeply seated.

Deafness. Cleft-palate. Hearing Improved after Staphyloraphy.

Mary P., aet. 25, suffers from congenital malformation of the soft palate, which is cleft throughout its whole length.

The patient has a nasal voice, defective speech, and deafness; the mucous membrane of the throat is congested, and the tympanal membranes are slightly opaque.

The opposite edges of the two halves of velum and uvula were taken off with the bistoury, on the 11th July, 1853; three sutures were introduced, and the parts evenly and securely brought together; union by the first intention followed, and complete cure was thus effected.

The middle suture was removed on the third day, the remaining two, on the fourth day, after the operation.

This patient again came under my notice on the 17th October, 1854: at this time her hearing, voice, and speech had all undergone considerable improvement.

Cleft-palate. Deafness.

A female, æt. 65, who lately came under my notice, was born with hare-lip, accompanied by cleft extending through the hard and soft palate.

The hare-lip was operated on, with success, in infancy; the palate has never been subjected to any surgical treatment.

The tympanal membranes are opaque; the mucous membrane of the fauces is rough, dry, and hard-looking, but comparatively pale, and commonly coated with dry and hardened mucus at the back of the pharynx; a state of parts in which the mucous membrane, lining the cartilaginous portion of the Eustachian tube, cannot fail to partake.

The deafness is extreme, and has been so for many years.

Cleft-palate. Deafness.

Mary J., æt. 19, a healthy and strong young woman, has become very deaf within the last three months, but "was not quick of hearing before."

The membrana tympani is opaque on both sides.

The soft palate is cleft, so that the lateral halves of the uvula are pulled towards the orifices of the Eustachian tubes.

There is chronic thickening of the mucous membrane of the fauces, which is rough, and very red.

The patient is not disposed to have any sutures applied to the cleft velum : and in her case this operation would be more difficult than usual, on account of the great distance of the affected parts from the exterior ; the lower jaw being unusually long, carrying, as it were, the mouth to a great distance from the fauces ; added to which, the patient only opens her mouth to a very limited extent.

SECTION VI.

Surgical Diseases, and Injuries of the Head and Face affecting the Ear. Injuries of the Ear from Violent Sounds.

Diseases.

Fungoid, or other malignant forms of disease, now and then arise from the mucous membrane lining the anfractuosities of the nasal passages and cavities ; the great and rapid growth of such masses readily accounts for the damage done to the organ of smell,—and, from the pressure downwards, or in the direction of the mouth, it is easily understood that the sense of taste may also be disturbed, by alterations taking place first in the roof, and afterwards in other parts of the mouth.

In such cases, the structure of the superior maxillary, as well as that of the nasal, ethmoid, and palate bones may be much altered ; the floor of the orbit

sometimes gives way under the ascending progress of the morbid action, and the eye is started forward, and perhaps downwards at the same time, by the development of the diseased growth in the back part of the orbit: in this way vision may be lost, while hearing is damaged, as will be readily understood, from mechanical interference with the functions of the Eustachian tube, produced by the presence of the fungoid mass in the neighbourhood of its guttural orifice,—to say nothing of inflammatory action started in this quarter, and carried through the Eustachian tube to the tympanum.

In some such cases the orbital plate of the frontal bone, or the cribriform plate of the ethmoid, or both, give way to the upward pressure of the malignant growth, which, in this direction, enters the cranial cavity, to interfere with the functions of the cerebrum, and to destroy intelligence, after it has previously damaged four out of five of the external senses.

In a case which lately came under my notice, all this was realised. The patient, a gentleman of 61, first consulted me when the left eyeball was pushed forward considerably by the progress of the fungoid disease, which, by this time, had reached the back part of the orbit. At a later period the malady showed itself

at the anterior nostril of the same side ; ultimately it seemed to have entered the skull, and the patient died of apoplexy, about six months after the time when the disease first attracted his attention.

It is worthy of remark, that, at the early part of the history of this case, but when the eyeball was a full half-inch in advance of that on the opposite side, the patient could see well with the displaced eye ; he had never at any former period complained of his vision, which was good, and at the time alluded to he stated that he could see equally well with both eyes ; in three months' time, however, sloughing of the cornea and destruction of the eyeball took place.

Deafness, on the affected side, was one of the features of this case which attracted attention ; and in the act of swallowing, the entrance of air to the tympanum, on this side, was not heard with the otoscope. Tumours of the hinder part of the jaws, as well as those of the back part of the tongue and pharynx, now and then interfere with audition, by encroaching upon the orifice of the Eustachian tube, or by so disturbing the parts, as to alter the state of this tube by pressure, with or without inflammation, swelling, or ulceration of its own structure.

In the case of a gentleman of Ormskirk, 58 years

of age, I removed a large fatty tumour from the back, weighing upwards of two pounds ; he recovered favourably, and enjoyed good health during two years after the operation ; at this period a tumour was found growing at the back part of the pharynx, covered by the mucous membrane, which was red, and glossy in aspect ; the tumour appeared to be, in shape and size, not unlike a pigeon's egg, somewhat flattened, and was placed a little more on the left than on the right of the median line ; it increased rapidly in size, and destroyed the life of the patient in about three months, and during the latter part of this time deafness on the left side prevailed.

A tumour, apparently of like nature, came under my notice in a young man of 24 ; feeble, and emaciated, when I saw him ; he had formerly been occupied as a tailor ; but, in this case the mass was seen behind the soft palate, as if descending from the base of the skull ; it occupied the whole breadth of the upper part of the pharynx, was apparently larger in size than the tumour last mentioned, and was divided by a middle sulcus, or depression, into two lateral portions. The patient was deaf on both sides, apparently from affection of the Eustachian tubes ; his suffering, in connexion with

respiration, deglutition, and speech, was very great, and the progressing exhaustion at last terminated in the long-wished for relief of death.

In this, as in the previous case, post-mortem examination was not obtained.

Morbid growths, arising immediately above the ear, are seldom met with, but tumours of different kinds, in front of it, behind, or below it, are by no means uncommon ; these may alter the position of the external ear as a whole, or may affect more especially the part against which they press, so as to change the shape of the concha, and in some instances to close in great measure the orifice of the external meatus.

In the case of a gentleman with tumour on the back of the neck, the size of two closed fists, the right ear was pressed forwards and outwards by the growth, a sort of tailpiece of which extended down the right side of the neck, in the direction^{*} of the carotid sheath ; the organ of hearing regained its natural position after the removal of the tumour.

Tumours about the angle, and ramus of the jaw, now and then interfere with the orifice of the external meatus, or with the calibre of the cartilaginous portion of this tube, or with both.

In the case of a gentleman of Lancaster, 55 years of age, the external meatus was nearly closed by the upward pressure of a large encysted tumour (the size of the closed fist) growing immediately beneath the ear, the lower part of which it lifted up ; the deafness thus caused was relieved by the removal of the tumour. In this operation, the main difficulty consisted in keeping clear of the divisions of the motor nerve of the face, found immediately behind the morbid growth ; there was no paralysis, in this case, from pressure on the facial nerve, although paralysis is occasionally met with where the offending and pressing tumour is of much less size.

In more than one instance, in sickly and serofulous young children, I have watched the progress of fungoid disease starting apparently, in some instances from the dura mater, in others from the periosteum of the bones of the head or face, and passing inwards, by various routes, to interfere with the organ of hearing, as well as with other important functions ; one growth of this kind, showing itself above the ear, came under my notice.

We now and then meet with *nœvus* in the aural region ; this affection, however, seldom interferes with audition.

In a case of very extensive nœvus of the upper lip, left cheek, and eyelids, from the labial portion of which serious hemorrhage had frequently occurred, I tied the common carotid artery with benefit ; the patient, a healthy girl, about 10 years of age, recovered favourably from the operation ; but it is worthy of notice, that during the first three days after the ligature of the artery, a considerable amount of deafness on the left side prevailed.

Tumours connected with aneurism of the carotid or vertebral artery, may tell upon the ear, and both have come under my observation ; these, however, like several other cases that have been alluded to, being grave affections that menace the life of the patient, are of minor interest, as far as the ear, or hearing, may be concerned.

Cancerous disease, commencing on the face, not unfrequently destroys the eyelids, and even carries away the eyeball ; this malady, however, rarely travels to the external ear by way of the cutaneous texture, and cancer of the auricle or meatus is by no means frequent.

Fatty tumours of the lobe of the ear now and then acquire an inconvenient size ; their mention, however, does not in strictness belong to this place ; such

growths, it need scarcely be said, may be removed by a very simple operation, bearing in mind that they are occasionally associated with morbid constitutional conditions.

In some cases of this kind I have found the central part of the tumour exceedingly soft, so as to suggest the idea of the presence of fluid, which did not exist ; this deceptive feel of the part has, if we may use the expression, a more cheating effect, when cutaneous disease of the auricle exists at the same time.

In inquiries relating to the state of the ear, more especially in cases where neuralgic or other irregular pains are complained of, we should never lose sight of the condition of the jaws, gums, and teeth ; and carious stumps, or even small remains of such parts, should be carefully removed, in all cases where there is reason to suspect that they are disturbing the nervous system of the part, or producing inflammation of the mucous membrane, which might possibly be continued towards the lining of the Eustachian tube.

Every one knows how easily irritation is carried from the ear to the teeth, as in the familiar instance of listening to the sharpening of a saw, &c., &c., until the teeth are set on edge ; and the pathologist should

bear in mind that irritation may pass in the opposite direction, or from the teeth to the ear. "Eye teeth" have been attended to, but ear teeth have not been named, or considered; nevertheless, dental irritation may lead to cophosis, as well as to amaurosis, as clinical records show.

The possible occurrence of irritation produced by artificial teeth, or metallic plates, worn in the mouth, in cases where ear affections at the same time prevail, is not to be lost sight of.

A bad state of the dental system, sometimes even of the maxillary bones as well, too often follows the continued employment of mercurial medicines, more especially in children, in whom the characteristics of scrofula are apparent; if, in such circumstances, the auditory organs are found to suffer, the state of the parts alluded to, and that of the mouth generally, should receive particular attention.

Two remarkable cases of tumour of the auro-temporal, and auro-maxillary regions, on the right side, came under my care soon after the above notices were written.

1. In the first case the patient was a man 50 years of age; the tumour was first observed about five years

ago, and has since gradually increased, until it has now attained a size equal to that of the human kidney, which it very much resembles in form, as well as in measure,—the sinus, or concave aspect of the tumour, corresponding to the upper and back part of the ear ; the auricle is pressed downwards and forwards by it, and the hearing diminished, more especially when the patient wears his hat, the putting on of which is difficult and painful.

The mass could be moved, on the subjacent bone, but its range of motion was very limited,—and it was evidently pretty firmly attached to the pericranium ; the integument covering it was somewhat closely adherent, so that, in raising a fold of it, but a short breadth could be seized ; through this a straight and narrow knife was passed, its back turned towards the tumour ; the skin, being thus divided from within, outwards, the line of section was lengthened, by passing the director between the cutis and the capsule of the new growth, and thus extending the slit from both ends of the first cut, so as completely to expose the mass to be dissected away by an incision a hand-breadth in extent, and corresponding to the long axis of the tumour.

The investing integument, as above noticed, was connected somewhat firmly with its fibrous capsule ; but the most firm attachment of the tumour was to the pericranium, corresponding to the hinder part of the temporal fossa, immediately above the mastoid process ; at this part, a dense cellular structure required division, which was effected, like all the rest of the dissection, with the back of the knife turned towards the tumour, and without the division of any important twig, either nervous or arterial.

A section of the tumour showed it to consist of an homogeneous fatty mass, enclosed in a strong fibrous capsule.

2. In the second case, the patient was a boy, 13 years of age ; his tumour was anterior and inferior to the ear, between the mastoid process and the angle of the jaw ; it was of the shape and size of a small pigeon's egg, evenly lifting up the skin, under which it moved freely ; to avoid subsequent deformity, the incision in the integument, for the removal of this growth, was made, as far as possible, internal to the projection of the angle of the jaw ; its length corresponded to that of the tumour, its direction differed little from that of the base of the jaw.

The mass was thus enucleated, and the borders of integument easily united by suture.

The tumour, when removed, was found to be encased in a fibrous capsule, of some strength, and with a somewhat smooth external surface.

When cut across, after its removal, it was not found to consist of one homogeneous mass, like the before-mentioned growth, but was made up of two degenerated cervical glands, placed, side by side, with their contiguous surfaces mutually flattened, like those of beans in their husk ; the central part of one gland had undergone somewhat more of morbid alteration than that of the other,—the section of one mass showing merely the structure of an enlarged gland, while that of the other displayed an amount of caseous, or yellow, semi-fluid material, characteristic of the products of the tubercular diathesis ; hence we see that the interior of this one tumour was made up of two distinct parts, placed in juxtaposition, and firmly bound together by the investing capsule, in the neighbourhood of which there was no other tumour, or morbid growth, nor any symptom of strumous alteration which might have occurred in recent or bygone time.

These tumours were removed at the Ear Institution

on the same day, and were, immediately after their removal, placed in a basin of cold water, when it was interesting to see the marked difference in their specific gravity ; the glandular tumour sank to the bottom like a mass of lead, while the larger adipose growth, removed from the man, floated on the surface of the water, as if its capsule had been filled with cotton.

The age and constitution of the patient, his occupation, and his greater or less exposure to the influence of unfavourable circumstances, as well as peculiar diathesis, time, and season, should all be taken into account in the removal of tumours such as these.

In the first case, the integument, so much extended by the growth of the fatty tumour, soon adapted itself, by gradual contraction, to the new limits assigned to it ; a little suppuration, attended by some swelling, occurred, but this speedily subsided, and a neat and even line of cicatrix remained, straight, narrow, and regular,—and the bagging which resulted from the operation, with the approximated edges of the skin, (at first superabundant,) soon gave way to an even and flat surface, resembling, and on a level with, the neighbouring parts of the scalp —and all this without the occurrence of any erysipelatous inflammation, the possible advent of which was not

lost sight of, either before, or after, the operation ; this occasional result of division of the scalp, in surgical operations, should always be borne in mind, and the aural region is especially prone to it ; so that it is generally not well to operate at a time when erysipelas prevails, or upon a patient who has suffered from repeated attacks of this disease, without the employment of all the circumspection, and the precautions which the circumstances demand.

In the case of glandular tumour, removed from the boy, a subsequent residence in the country, with the aid of good diet, and suitable clothing, exercise, and rest, were thought not unworthy of attention, lest the local irritation, which the operation might possibly have set up, should be followed by any disturbance of the general health, or of the glandular system of the neck.

Tumours situated like the first, are troublesome from their position, and bulk, and from the effect they may produce on the external ear ; but, even if allowed to remain long undisturbed, or untouched by treatment, they rarely attain to any state which seriously injures the function of the neighbouring parts, or renders their ultimate removal difficult, or hazardous.

A different observation requires to be made with

regard to tumours in the anterior-aural, parotid, or submaxillary regions ; if left long to themselves, they may interfere with the functions of parts in their vicinity, and, because of adhesions, or connections gradually contracted, their removal may be attended with danger to nerves, blood-vessels, or the parotid duct ;—this danger should be especially borne in mind in cases where the outline of the tumour is not sharply or well defined, or where there is any irregularity about the form, or doubt about the connections, of its deeper parts—conditions of great practical importance, and now and then met with in cases of congenital tumour of these regions.

In the case of a female of 45, lately under my care, a tumour of the size of a duck's egg was removed from the same anatomical organ as that in which the tumour of the boy, before noticed, was formed ; the operation was successful, and the patient recovered favourably.

This tumour had been observed from the earliest period of life ; the patient did not remember any time when it did not exist ; and her idea was, that it was congenital.

At the time of the operation, its inner part was found deeply and firmly connected in the direction of the

carotid, and neighbouring parts, added to which, no satisfactory outline, or boundary, could be felt, although the mass was well defined on the exterior ; on this account, it was deemed prudent to apply a ligature to the deepest part which could be reached, after which it came away, without the occurrence of any haemorrhage—an event somewhat feared, from the blue and evidently vascular character of the growth, an aspect which was very clearly seen when the integument was divided, and the margins of the wound turned aside.

A tumour, in some respects resembling the last-mentioned, came under my notice, in a gentleman, 50 years of age ; it was of the size of a hen's egg, flattened, and situated closely in front of the right ear, on the side of the cheek ; the morbid growth had always been regarded as congenital, but of late years it had increased considerably in size ; its surface was uneven, as if from the projection of small lobules, or vascular masses, within ; and the feel of the whole, when handled, or rather fingered, except that it was more firm, reminded one of that earthworm feel imparted by varicocele, when the distended vessels in the bottom of the scrotum are rolled upon the end of the fingers. In this case the integument was too closely and too irregularly

connected with the subjacent tumour to admit of easy elevation and dissection from it ; hence this was not attempted ; and the mass was removed with the aid of double ligatures passed beneath it, crossing in the middle at right angles, and tied at its upper and lower extremities ; the strangulated parts separated favourably, and thus cure was effected.

Injuries.

Amongst the serious consequences of injuries of the head are disturbances of intelligence, of ordinary sensation and motion, and of the functions of the organs of sense.

Cases of fracture, affecting the base, the hinder part, or the sides of the skull, frequently tell upon the ear ; while the softness of the auditory nerve, the delicacy of the membranous labyrinth, and the fragility of the contents of the tympanum, render it extremely probable, that any force great enough to damage the resisting petrous bone, will be more than sufficient to break in pieces, crush up, and destroy, the finely organised mechanism of the auditory apparatus. For obvious reasons such cases belong to that important part of Surgery which considers injuries of the head ; for where life is in danger, the ear is relatively of little importance.

The Eustachian tube does not often suffer, in cases of injury of the head ; but we should always bear in mind that this tube, and tympanum, together, form a sort of diverticulum from, or appendage to, the respiratory apparatus ; and that any laceration of the mucous membrane of these parts, more especially in the wider, or guttural, portion of the canal, may allow air to enter, or be blown, (as in the act of blowing the nose, &c.) into the sub-mucous cellular tissue, which might close the Eustachian tube, and thus for a while cut off the communication between the throat and the tympanum—a state which would be characterised by deafness, as well as by the special symptoms of emphysema.

Emphysema of this kind may extend very widely, so as to affect the face and neck, and even the chest, on the side of the injury ; and the serious nature of such cases suggests at least the importance of employing the Eustachian catheter with great gentleness and caution, so as to guard against any solution of continuity, in the mucous membrane, lining the parts along which it passes. The catheter and air press together, form a complete engine for the production of emphysema, if not carefully handled.

It is just worthy of mention, that a temporary closure

of the Eustachian tube, by emphysema, might be converted into a permanent one, by the concurrent influence of inflammatory action, glueing together the approximated sides of its mucous membrane.

A very striking case, in part illustrative of these remarks, was brought under my notice about seven years ago. A young man received a blow on the left eye; this was followed, not by a black eye, as often happens, but by a remarkable prominence of the eyeball, with partial loss of sight; the side of the nose was struck at the same time with the eye; there was slight bleeding from the nostril on the side affected; blood followed on blowing the nose, &c.; and it appeared that atmospheric air had been driven from the nasal passages into the sub-mucous cellular tissue—and that, in this way, it had reached the hinder part of the orbit, thence pushing the eyeball forward, and rendering complete closure of the eyelids impossible.

The recovery of this patient was slow; as the air was gradually absorbed, the eyeball gradually assumed its natural position and aspect, and the vision from day to day improved.

Although this case may seem to have no direct bearing on affections of the Eustachian tube, it has an

important relation to injuries of the nasal, and neighbouring parts of the respiratory system, the effects of which, when emphysema occurs, may be so very various. It is probable, that, in this instance, the patient suffered from fracture of some part of the fragile bony framework of the ethmoid, in connection with which the mucous membrane had been torn—a sort of compound fracture, with solution of the continuity of mucous membrane, instead of that of skin.

In such cases, one of the possible occurrences is, the entrance of air into the vascular system, or even into the cranial cavity, should the cribriform plate of the ethmoid be broken. From such occurrences, we can easily understand how death might take place—an unfortunate event, which is said, in more than one instance, to have been caused by inflation of the tympanum through the Eustachian tube; and it is not impossible that this might happen even to the most skilful and cautious practitioner.

In cases where patients recover from injuries of the head, which have told upon the auditory organ, troublesome ear affections not unfrequently remain, after the more serious part of the injury, or the head affection, has been overcome by nature and art.

Such morbid conditions are but too often out of the reach of therapeutic agents. It is easily understood that solutions of continuity, affecting any of the parts of the internal, or middle ear, accompanied perhaps by the extravasation of blood, or serum, or followed by the occurrence of inflammatory action, the deposit of lymph, or the formation of pus, must be regarded as diseased states of very serious character ; while the alterations presented, in such cases, by the proper structures of the ear, are likely, very often, to yield but little to the power of ordinary remedies.

In cases of this kind, we now and then find remarkable opacity of the membrana tympani—the product, most frequently, of inflammatory action, which has told upon the mucous lining of the tympanic cavity ; this state of the membrane is often accompanied by narrowing of the bony part of the external meatus, produced by thickening of its cuticular lining ; laceration, or perforation, of the membrana tympani, is not often found in cases of this kind, if the examination be made any considerable time after recovery from the primary effects of the accident ; but it is probable that such states would be more frequently met with, if solutions of continuity, in the membrana tympani, had not been

repaired by the efforts of nature—proof of which occasionally appears in the apparently diminished size, puckered aspect, and roughened surface, of the membrane, through which no part of the malleus is visible—and where the normal and external concavity of the membra *tympani* has been lost, in giving place to the irregular appearances above noticed.

In such cases, if remains of inflammatory action be not met with—if there be no discoverable obstruction, adhesion, deposit, morbid thickening, or new growth, in the meatus, Eustachian tube, or tympanum, the prognosis relating to the deafness, tinnitus, or pain, from which the patient might suffer, would certainly be unfavourable.

Here the prognosis relating to pain may sometimes be more favourable than that which relates to the deafness, or tinnitus. It is true that, in many of the cases where pain is complained of, this will be found to depend upon remains of inflammatory action, affecting some part of the organ, frequently the structures within the tympanum ; and it is worthy of particular notice, that such pain is now and then remarkable for its periodical character, and its nocturnal exacerbations. The “fits” of such pain seldom occur by day ; while in neuralgia of the ear, depending apparently upon some morbid

condition of the fifth cerebral nerve, the suffering may be great by day, and less felt by night, as is shown in a remarkable case of this kind, at present under my care.

In the examination of ear affections, that have followed injuries of the head or face, it is of importance to attend to the state of the maxillary and dental arches, and to that of the temporo-maxillary articulations ; and if dislocation, or fracture, have occurred, to observe the state of parts which the reparative process has left behind.

In the child, the comparatively soft and yielding condition of the skull, as yet not completely ossified, or converted into one solid bony case, is one amongst many guards against fracture, which belong to the privileges of childhood.

In the adult, and still more in the aged, the hard, and even brittle, and unyielding condition of the bones (or one bone, for now it might be called so,) of the head, tends to favour the occurrence of extensive fracture, whenever its causes are brought to bear upon the cranium.

It is worthy of particular notice, that accidental injuries, inflicted on the ear in very early life, may hinder or modify the future development of the organ,

so as to damage considerably, if not altogether to destroy, its functions.

Here, as in other cases of deafness, one of the first considerations of the practitioner is to determine whether the external, or the middle ear, is the main sufferer, or whether the injury has told upon the labyrinth, or auditory nerve beyond it.

In some cases, the patient will state that he hears well the sounds produced by, and within, himself, showing that his auditory nerve is in a condition to *receive* them; but that he cannot hear the language, or the sounds, produced by others, showing that the accessory, conducting, or tympanic part of his ear, is not in a condition to *bring* them.

In other cases, where the auditory nerve has suffered, the patient may not be able to hear his own voice, his respiration, the sound of his heart, the rumbling of his bowels, or the stamp of his foot.

The following case of disease of the ear after external injury may be very shortly stated.

Deafness and Otorrhœa, after blow on the Head.

Master T., æt. 13, son of a farmer in Cheshire, suffers from extreme deafness, with otorrhœa on the left side ; these complaints are of three years' duration ; and, from the account of the father, came on immediately after a smart blow inflicted on the side of the head with a ruler, wielded by the village schoolmaster.

Inflammation of the lining membrane of the tympanum seems to have been produced by this injury ; abscess formed, and made its way into the external meatus, by destroying the membrana tympani, of which there is at present but a slight peripheric trace.

The integument over the mastoid process was kept sore by the occasional rubbing on of the nitrate of silver ; an occasional aperient was given, the muco-purulent matter was frequently washed from the meatus and tympanum, and a solution of acetate of zinc, and afterwards a weak solution of nitrate of silver, dropped in, the citrate of iron and quinine being all the while administered, with a view of meeting favourably the pale and enfeebled aspect of the patient, who was very much benefited by the treatment.

The hearing was improved ; but the otorrhœa had

not altogether disappeared, the last time the case was observed.

In this instance, the deeper, or bony part of the meatus, on the side affected, was much narrowed by thickening of its lining membrane; this part of the external canal, as well as the tympanum, and the intervening membrana tympani, having all suffered, together, from the injury alluded to above, and to such an extent, that it is probable the normal condition of the meatus will never be regained.

Deafness, after blows on the Head. Opacity of the Membrana
Tympani. Ceruminous Accumulation.

Sept. 29, 1853.—M. K., æt. 22, a strong healthy girl, had no defect of hearing until the age of twenty, when she received several blows on both sides of the head, from the closed fist of her father, who was in a state of intoxication at the time, ever since which she has been deaf.

The external meatus, nose, Eustachian tube, mouth, and fauces being examined, no appreciable anatomical lesion is found; but in the bottom of the right meatus,

and close upon the membrana tympani, a considerable amount of dark-coloured ceruminous accumulation is observed ; this was removed, and the hearing thus somewhat improved.

The membrane of the drum, now more clearly seen than before, is on both sides of a dull white colour, and wants its natural and characteristic glistening appearance.

In cases of imperfect hearing, it is by no means uncommon to find two causes in operation, and such appeared to be the case in this instance ; there is no doubt that deafness was produced by some altered condition of the ears, which followed the blows on the head, but of late it had evidently been increased by ceruminous accumulation. Such considerations are of importance, both in diagnosis and prognosis, the latter of which should not be given, except with great caution, until, by the treatment of the case, the additional, or secondary deafness shall have been, as far as possible, removed, and thus the real amount of what may be an incurable defect of hearing ascertained.

In this case, the state of the tympanum, as indexed by the condition of the membrana tympani, accounted for the primary, and the ceruminous accumulation for the secondary, or superadded, deafness.

In cases of this kind solutions of continuity occasionally occur, and sometimes in the chain of ossicula, sometimes in divisions of the auditory nerve, spread within the cavities of the internal ear ; and the shock, it is obvious, might tell in both these regions at the same time ; unfortunately such alterations cannot be brought within the reach of any known means of complete diagnosis.

Deafness, after injury of the Head. Opacity of the Membrana Tympani.

July 12, 1854.—S. P., æt. 24, a dark-complexioned, healthy, and strong man, had no aural complaint until about six weeks ago, when he received a severe blow from a block, when at sea. A scalp wound was inflicted about three fingers' breadth, above the left ear ; this wound healed favourably, but left-side deafness followed.

The left membrana tympani displays a most remarkable condition of opacity, being perfectly white, except at one point in the centre ; it might be compared to a piece of thick white leather, closing the meatus.

A seton was passed into the nape of the neck ;

it was kept in during ten weeks with very remarkable benefit to the hearing ; its good effect being aided by a course of alterative aperients ; these are spoken of as auxiliaries, inasmuch as the seton was probably the main remedial agent ; the improvement in the hearing was most likely due to a gradual removal of some morbid condition of the interior of the tympanum, which had resulted from the accident above named ; there was no very remarkable alteration in the appearance of the membrana tympani, even when the hearing was already much altered for the better, and it is worthy of remark, that, in many cases of opacity of the membrana tympani, the great diminution of hearing which may be met with, is not accounted for by the condition of the tympanal membrane, but is owing to alterations in parts more deeply seated, and which cannot be subjected to ocular inspection ; such additional morbid conditions having, in most cases, been produced by the same causes which gave rise to opacity in the membrana tympani.

One advantage of the seton in these cases is the local abstraction of blood, which is effected by its introduction ; and this is a little favoured by passing the seton needle rather obliquely, so that the blood at

first, and the discharge afterwards, may run off at the lower end of the canal.

In this case, the circulation in the vicinity of the ear had evidently been very much excited and disturbed, and, hitherto, antiphlogistic means had not been resorted to ; the introduction of the seton was followed by a very profuse discharge of blood, the oozing of which did not cease for two hours after its employment, but after this short lapse of time, the patient found himself able to hear very much better than before, and was also free from headache, from which he suffered immediately before the introduction of the seton, as well as during all the previous time since the injury of the head was received.

Deafness after injury of the Head.

December 3, 1855.—Patrick F., æt. 21, is extremely deaf; the loss of audition is attributed to a blow received on the left side of the head about six months ago; the blow alluded to “was struck by a table connected with the vertical of a drilling machine” in rapid motion, and seems to have been very severe; the patient was completely stunned, and deprived of his

senses at the moment, and was afterwards confined two days to the house, with severe pain in the left side of the head and in the left ear.

Pain in the left ear has prevailed ever since the time of the accident ; this pain has been most severe in the night time, when the patient was warm in bed ; he remarks that when he went to bed without the pain, he commonly awoke and found himself suffering from it, between one and two o'clock in the morning, after which it continued to trouble him until the hour for rising ; but ceased in the forenoon when he had been a little time at his work.

The hearing is damaged on both sides, but much more on the left than on the right.

The Eustachian tube is pervious on the right side, impervious on the left.

The nocturnal otalgia on the left side, which is the main suffering of which the patient complains, depends on chronic inflammation of the lining membrane of the tympanum : the effect of the outer part, if so we may express it, of this inflammation, is seen in the injected and reddish grey condition of the membrana tympani, observed with the aid of the speculum.

In this case the patient was cured by leeches,

applied to the front of the ear, and blisters applied behind it, aided by pills of calomel and hyoscyamus, and a temperate diet, with the securing, as much as possible, of a state of repose for both body and mind.

Eustachian catheterism, and inflation of the tympanum, were employed on the fourth day of the treatment, when the left-side deafness was at once surprisingly improved.

Deafness, after Blows on the Head.

October 18, 1854.—Isabella C., æt. 44, was married at 22, and has been a widow during the last five years; her husband used frequently to beat her about the head—and to injuries thus received she attributes her deafness, from which she has suffered during the last seven years.

The left ear, to use her expression, “is quite gone;” with it she cannot hear the watch, closely pressed upon the auricle; the hearing distance for the watch, on the right side, is three inches.

Tinnitus in the left ear is compared to the noise of “carts on the road, steam-engines at work,” &c.; and the patient further remarks, that often such noises all

at once cease, when a remarkable feeling of quietness comes over her ; these noises have prevailed as long as the deafness.

On both sides the membrana tympani is opaque, white, and leathery in aspect ; there does not appear to be any nasal, or guttural complaint ; and, on both sides, the entrance of air to the tympanum is distinctly heard with the otoscope.

The patient was recommended a course of iodide of potassium, with sarsaparilla, counter irritation over the mastoid process, an occasional aperient—to avoid the influence of atmospheric vicissitudes, to keep the feet warm, and, upon the whole, to guard the general health, as a main source of probable improvement in audition ; further observation of the case was not made.

It is possible that mucous accumulations occasionally take place in the tympanum of this patient, and that a partial obstruction of the Eustachian tube now and then prevails ; such conditions, however, did not appear to exist at the time when the case was observed—the opacity of the membrana tympani being the chief remains of former morbid action.

Deafness, after Blow on the back of the Head.

October 13, 1854.—R. P., æt. 48, a very strong man, fell from a height of about ten feet, now seven years ago, and struck the back of his head against a wall.

There was no external wound of the head, or other part, but a state of insensibility and stupor was produced, which continued during three days; after which, he says that when he came to himself, he did not know where he was; and that when he first rose up, he found that he could not support himself on his legs, but immediately fell down again.

Deafness on the right side has prevailed ever since the above accident; on the left, the hearing distance for the tick of a watch is six inches; on the right, it is not heard even when held closely upon the ear; the tympana are inflated from the throat.

The only morbid appearance, at present remarkable, is, a slight degree of opacity of the right membrana tympani, not sufficient to account for the deafness; hence there is some reason to think that the function of the terminal ramifications of the auditory nerve has been damaged by concussion, or by injury to the petrous portion of the temporal bone—in connection with which,

it is of course impossible to say whether effusion of blood into the tympanum, labyrinth, or meatus auditorius internus, or effusion of lymph from inflammatory action, or some disturbance of the organisation of the intra-cranial part of the auditory nerve, or of the neighbouring part of the brain, may not contribute to establish the condition which now prevails.

In such a case, the separation of the base of the stapes from its connection with the membrane of the fenestra ovalis, to say nothing of any other kind of break in the chain of ossicula, might possibly happen ; and the inner extremity of the chain of ossicula remaining afterwards free in the tympanum, the communication between the membrana tympani and the membrane of the fenestra ovalis would thus be interrupted, and useful hearing destroyed.

Here it may be remarked, that the chain of ossicula has a very feeble point, which corresponds to the position of the os orbiculare, and that it not unfrequently gives way in this situation, leaving the stapes in connection with the membrane of the fenestra ovalis.

Deafness. Injury of the Lower Jaw, followed by Exfoliation.

July 15, 1852.—Eliza S., æt. 50, from Chester, received a blow upon the angle of the lower jaw. The patient had the impression, at the time, that the jaw at this part was fractured; however this may have been, inflammation and extensive destruction of the osseous structure has been set up, by which the whole projection of the angle of the jaw has come away, bit by bit, through a small external opening opposite the injured portion of bone.

In consequence of the injury to the articular apparatus on one side, the relative position of the maxillæ has been altered, as we find it to be in some cases of paralysis, where there is first a little twisting of the lower jaw to one side, and afterwards a retraction of this bone, so that the extremities, or edges, of the lower incisors, are more or less hidden behind those of the upper row.

Although there was no visible evidence of injury to the temporal bone at first, a considerable amount of deafness prevailed for many weeks after the accident, with which some tenderness of the mastoid region was associated. This deafness was more than once relieved by the application of leeches to the tender part. It is,

however, worthy of remark, that the meatus externus of the ear required attention during the time that the maxillary affection was being treated, as the inflammatory disturbance in the neighbourhood interfered with the action of the ceruminous glands, of which one result was a coating of the outer surface of the membrana tympani with brown and hardened wax. The alterations of audition, which these accumulations caused, were from time to time remedied by clearing out the meatus with the aid of the usual instruments.

Deafness in a Boxer from Injury of the Tympanum.

Fracture of the Lower Jaw.

A. B., æt. 32 years, is "a boxer by profession," and hence exposed to frequent contusions of the head and face; his audition is defective on the left side, where, for the tick of a watch, the hearing distance is two inches, while that of the right side is twelve inches.

The lower jaw on the left side was broken some years ago, and a prominence, from projecting callus, now marks the site of the fracture; and it seems probable that the tympanum of this side was injured at the same time. Here the membrana tympani, at its upper part, looks rough, irregular, and red, contrasting

in appearance, in a very marked manner, with the membrane in the opposite ear, which has its normal glistening aspect; in the latter, the connection of the malleus is discernible, but not so in the former.

Cases of deafness following accidental injuries which have told mainly on the jaw are now and then met with in practice; if recent, the deafness may often be relieved; but in the cases of long standing, therapeutic agents have too often but little effect, inasmuch as the changes resulting from inflammatory action, following the injury, are often such as are not likely to be removed by either general or local remedies.

Serious affections of the ear itself, of the nervous, and muscular systems, of the brain, and occasionally of the eye, may follow the introduction of foreign bodies into the external meatus, and are now and then produced, in great measure, by the efforts made to extract such bodies from this canal.

Any foreign body, forced into the depth of the meatus, may break through the membrana tympani, and thus destroy the delicate organisation of the auditory ossicula, the chorda tympani nerve, &c.; and sharp, or needle-shaped bodies, may be stabbed even

into the internal ear, by striking into the fenestra ovalis, (as in the case of Speranza, of Parma,) or fenestra rotunda, or by breaking down the promontory between these apertures. Fatal cases of this kind are on record, and a serious case of facial paralysis following the introduction of a foreign body into the meatus, and the attempts to extract it, has been previously alluded to.

Injuries of the Ear from Violent Sounds.

Amongst accidental injuries inflicted on the ear may be classed the effects of unexpected, sudden, and violent sounds.

The less we are prepared for such sounds, in other words, the less we expect them, the more injurious do they seem to be; when we know of their approach, the muscles which act upon the ossicula and tympanal membranes seem instinctively to give to these delicate structures that kind and degree of tension which may best enable us to receive the shock without damage to the membrana tympani, the chorda tympani, the ossicula, or internal ear.

Many cases illustrative of these remarks have, at different times, come under my care; a little harvest

of them, if so it may be expressed, was reaped a few months ago, at the time when his Royal Highness the Duke of Cambridge paid his auspicious visit to Liverpool. The joyous firing then indulged in, unfortunately left very painful impressions in the startled ears of several citizens of the “good old Town.”

It is known to naval and military surgeons, that rupture of the membrana tympani, followed occasionally by bleeding from the external meatus, is sometimes met with in those who are exposed to the roar of heavy pieces of artillery.

It is probable that the yielding of the membranes with which the ossicula are connected may tend to prevent the breaking of their delicate chain, or the separation of the stapes from the membrane, or the fenestra to which it is applied.

In cases where the sonorous shock is extreme, we can easily suppose that the terminal spread of the acoustic nerve might be injured, in other words, that the ear might be paralysed, by thunder, as the eye is known to have been by lightning; happily the occurrence of the two misfortunes at the same time, or from the same meteoric source, is scarcely to be found in the records of accident.

The imperfection of any examination which can be made in the living subject, in cases of this kind, prevents our knowing how much the middle ear, and, still more, how much or how little the internal ear, may be altered ; it seems probable that in many instances the main injury is done to the middle ear, or conducting part of the auditory apparatus, while the internal, or recipient part, undergoes less anatomical change. In these cases the membrana tympani, and with it the chorda tympani nerve, must receive the shock at first, and the tinnitus which immediately follows, and which is not always accompanied by deafness, seems to direct us to these injured parts as its main source.

A lady of fifty-three, who has lately come under my care, suffers from constant tinnitus in the right ear, which is now of six months' duration. One evening a pistol was fired close to her right ear, with a view to startle or frighten her ; the tinnitus came on immediately afterwards, and has ever since continued ; she is not deaf, although the right membrana tympani is opaque.

A gentleman of thirty has had tinnitus on the right side during the last three months ; it was produced by the discharge of fire-arms very near to him, and came on immediately after the shock. He is not deaf.

In both these cases a sort of sub-acute otitis affecting the tympanum, and accompanied by injection of the membrana tympani, and occlusion of the Eustachian tube, came on gradually after the accident, and was subdued by antiphlogistic treatment, which, however, seemed to produce little effect upon the tinnitus.

(The rupture of the membrana tympani, *really* from without, as in the case of violent sounds, and its bursting, *apparently* from within, as in cases of suicidal strangulation or hanging, may be contrasted, until the latter kind of injury be more completely studied and its nature more fully determined.)

It appears worthy of remark, that these injuries appear to tell much oftener upon adults, and those somewhat advanced in age, than they do on children or very young people, whose more yielding and progressive organisation seems better adapted, as it were, to bend under, and thus throw off, the effects of this kind of shock. This allusion is made, bearing in mind, the while, that the very young are less exposed to the causes of the injuries now contemplated.

Paralysis of the portio dura has been produced by the shock of violent sounds, and this even when the auditory nerve has not suffered. This appears to be a

very singular fact, even when all allowance is made for the anatomical connection which this nerve has with the bony and tympanic parts of the auditory organ—with the vidian nerve, and with the tensor tympani and stapedius muscles, through the medium of the nervous twigs, which it supplies to them.

Paralysis of the facial nerve occurring as a result of tympanitis, which violent sounds occasionally produce, is easily accounted for ; but the paralysis alluded to above, is that which occurs at the moment the shock is felt, and, of course, without the previous occurrence of inflammatory action, by the progress of which the chorda tympani might undergo morbid alteration, capable of being continued to the facial nerve in the aqueduct of Fallopius.

The careful observation of different forms of paralysis of the facial nerve, is at once curious and interesting, and is important in connection with the study of aural surgery ; bi-lateral paralysis of this nerve is rare, but the uni-lateral form is of frequent occurrence.

In the study of paralysis of the facial nerve, in connection with ear cases, the various modes of occurrence of this paralysis, apart from aural disease, should be carefully borne in mind.

Injuries, and diseased actions telling upon it, at three different parts, may, any one of them, destroy its power, and thus paralyse the facial, and other muscles, it supplies.

1. Disease within the skull, or accidental injury affecting the intra-cranial portion of the nerve.
2. Disease, or injury affecting the nerve, in its passage through the temporal bone.
3. Tumours, swellings of the parotid, or other neighbouring part, or accidental injuries, such as wounds, or contusions, telling upon the *trunk* of the nerve, below its exit from the stylo-mastoid foramen.

(The division of this nerve, in the same part, as first performed by Klein of Stuttgardt, for the cure of tie-doloureux, produced, of course, the same unhappy effects of paralysis, with nothing better to counterbalance them.)

4. External agents, such as the impressions of cold, &c., applied to the terminal distribution of the nerve, in the head, face, and neck; as well as wounds, contusions, &c., affecting some *division* of the nerve, away from, or below, the stylo-mastoid foramen.

It need not be stated that practitioners meet with all these different forms of facial paralysis ; the third form, or that from tumour, &c., or from accidental injury affecting the nerve in the parotid region, is rare ; but it now and then occurs : this might also be said of the paralysis from wound, or contusion, of one of the terminal branches of the nerve, which is yet more rare ; but of this kind, a remarkable instance has lately come under my notice.

The second form of facial paralysis, or that produced by disease, or injury, of the aural (commonly the tympanic) portion of the nerve, is more especially interesting in connection with diseases and injuries of the ear.

The fourth kind of paralysis, or that following impressions made by external agents upon the terminal, or peripheric part of the nerve, is of two kinds, as far as the mode of origin is concerned. It may arise, as it most frequently does, from what we may term a widely-spread impression, such as that of cold, acting upon the side of the head and face, and thus affecting, as it were, the whole of the *pes anserinus* ; but, on the other hand, it may follow an injury inflicted upon some one branch, or upon one or two neighbouring branches, of the nerve, as in cases where facial paralysis follows a contusion, or

wound, of very limited extent, inflicted on the side of the head or face.

The following cases, showing some of the different modes of origin of this paralysis, or the different localities of origin, if this expression may be employed, may be shortly stated, by way of a partial illustration of the preceding remarks.

Facial Paralysis, with Paralysis of Left Arm.

Mr. J., æt. 47, a healthy man, says that he “never ailed anything” in his life ; but about a fortnight ago he took a warm salt-water bath, remained in it a long time, and afterwards walked home—a distance of a little more than half a mile. On his way, he felt something amiss with him ; and it was soon found that the left arm and the left side of the face had lost all power of motion, sensation in both parts remaining undisturbed.

Motor nerves, both cerebral and spinal, require to be contemplated, in connection with this case. In the next case, a cerebral motor nerve is affected, while the spinal system remains intact.

Otalgia. Facial Paralysis.

October 3, 1854.—S. A., æt. 27, a fair-complexioned, strong, and healthy-looking engineer, suffers from left-side facial paralysis, with swelling of the cheek and parotid region, giving to this side of the face a slanting form, which contrasts in a marked manner with the more flat cheek on the opposite side.

The affection is accompanied by great pain in the left ear, as well as in the head and face.

Some of the ordinary symptoms of facial paralysis are strongly marked; the mouth is drawn upwards, and towards the right side—but the tip of the tongue, when protruded, deviates also to the *right* side; the left eye cannot be closed; and when the patient attempts to whistle, he fails, from want of power in the left side of the mouth.

The patient attributes the attack to the practice of sucking ice, when he was intensely heated, in the hot days of this summer; he was, at the time alluded to, (the latter days of May, 1854,) at Boston (America); two months, however, elapsed, after this practice was discontinued, before the affection of his face and ear came on; and, on inquiry, it is found that, three days

before the occurrence of the attack, he went from Liverpool to Manchester in a third-class railway carriage ; the day was very damp, with “ mizzling rain,” and the cold breeze upon his face, through the open window of the carriage, was very much felt ; this was between nine and eleven o’clock on Friday morning, about eight weeks ago ; and on rising from bed, on the following Thursday morning, the pain in the left ear, side of the face, and head, with the paralysed condition of the muscles, were first felt ; although there had been no complaint whatever on the previous night, at breakfast, soon after he first found himself ailing, the food in the mouth was well felt on the left side, but the patient was unable to roll it about, mainly, he says, “ from want of power in the cheek.” In speaking of his feelings at the commencement of the attack, the patient says that the intense pain was “ just at the butt of the ear,” beating, throbbing, and shooting to the back of the head, to the top of the head, and to the eye.

The Eustachian tube is pervious on both sides, and in the pharynx everything is normal. The hearing distance for the tick of the watch is six inches on the diseased, and twelve inches on the sound, side.

A feeling of extreme “ dryness and hardness, as if

it were dry inside," prevails in the affected ear. Pulse 90, tongue clean.

Bleeding to ten ounces, in the left arm, six leeches to left parotid region, a blister to the back of the neck, and an active aperient, followed by a pill of two grains of calomel, with half a grain of ipecacuanha every two hours, was the main treatment employed, after which the pain and swelling vanished, and the paralysis gradually disappeared.

In the last mentioned case we have found paralysis from the effects of cold acting widely upon the side of the head and face; in the next case, the same kind of paralysis occurs from injury inflicted upon one point, or upon a part of very limited extent.

Mr. E., æt. 40, a healthy man, was busy early in the morning, in a room containing bars of iron placed horizontally, and projecting in various directions; against one of these bars he struck his head very violently, the end of the piece of iron which hit him was of small size, the part struck was the right temple, about half an inch outside the external canthus; the integument was scarcely wounded, but the edge of the orbit was depressed, or driven inwards by fracture; complete right side facial paralysis occurred about two

hours after the accident, it continued some months, but the patient afterwards gradually recovered the normal condition and use of the affected parts. In this case the injury also told upon the fifth nerve, the patient being deprived of sensation in the parts affected.

This case had many curious features, connected, in the main, as it would seem, with injury of the fifth nerve.

The temporal, pterygoid, and masseter muscles, of the affected side, were deprived of power, so that mastication was performed with great difficulty.

Complete paralysis of sensation prevailed on the affected side of the face, this was accurately bounded by the median line; the skin was altogether "without feeling," and yet the act of shaving was "very painful," and was accompanied by "a feeling as if something beneath the skin caused the pain."

On the affected side, the mucous membrane of the mouth was also deprived of sensibility, so that on the right side of the mouth, the food could neither be moved, felt, nor tasted.

The patient remarked that the feeling was very different in the front and back of the mouth; at the

lips, he had sensation on one side only ; in the fauces, he had complete feeling on both sides.

The injury done to the eye, at the time of this accident, was but very slowly recovered from ; although the patient could see the letters, and the lines of type, on a printed page, he could not move the suffering eye from one line to another ; and the affected eye became, as it were, fixed, and interfered even with the movements of the opposite eye—so that the patient was obliged to cover the damaged eye with his hand, by way of giving freedom to its uninjured fellow.

In ten minutes after the accident, the patient, although conscious, found himself unable to speak ; by applying his finger to the part, he felt the depressed portion of bone ; he now placed the end of his finger between the fragment of bone and the ball of the eye, and thus drew the osseous piece outwards ; *after* this act (whether or no in consequence of it), his speech returned, and at the same time a most violent headache came on ; and a small piece of wet linen, applied to the bruised part, “felt like a weight of 100 lbs.”—a sensation which was relieved by the attendants lightly lifting it, so as to prevent its exerting any pressure.

In the cases just mentioned we have instances of

facial paralysis, to which the names central and peripheric have been applied. In the next following, the mischief does not commence at the root of the nerve, (or within the head,) nor in its peripheric or terminal parts, but in the intermediate, or tympanic, part of its course.

Two children, a brother of 10 and a sister of 5 years of age, have lately had scarlet fever; on the father's side of the family ear disease prevails; these children are now suffering from serious forms of aural malady; in the case of the boy, the membrana tympani is entire on both sides, and otorrhœa has not occurred; but he labours under a right-side otalgia, associated with indescribable suffering, lancinating pains darting through the ear, at intervals of two, three, or five minutes, more or less, and continuing from morning to night; in the night, however, he sleeps well, and feels no pain.

In the case of this little boy, abscess of the tympanum has not occurred; in the case of his sister, this occurrence has taken place on one side; the membrana tympani has been perforated by ulceration; otorrhœa exists, and with it facial paralysis.

The boy is in a slight degree deaf; but his sister,

on the affected side, suffers from considerable loss of audition.

In the study of these different varieties of facial paralysis, the ear should never be overlooked, as there is reason to think that the difficulties of diagnosis might occasionally be lessened, if the state of the petrous bone in general, and of the aqueduct of Fallopius, and the tympanum and its appendages in particular, were more carefully attended to and better understood.

In such inquiries, we must bear in mind the three-fold nervous system of the ear, or the nervous supply for special sensation, for general, or common sensation, and for motion; this sort of consideration should also be extended to the side of the head and face, where the condition of the muscles mainly employed in mastication, and supplied by the motor branch of the fifth cerebral nerve, will commonly be found to contrast strongly with that of the superficial facial muscles, employed in respiration, speech, and expression, and supplied by the portio dura of the seventh pair.

In the cases of facial paralysis above noticed, with one exception, the affection was confined to the muscles supplied by the portio dura, and there was no symptom which betrayed any morbid condition of the fifth cerebral

nerve—no want of sensation, no want of power, in the lower jaw.

In the remarkable case where paralysis of the *portio dura*, as well as of the fifth, seemed to follow injury of their branches, it should be stated that a very serious head affection, attended by delirium, came on about six hours after the accident ; so that, in connection with the paralysis of these nerves, we must look to the disturbed condition of the cerebrum, as well as to the injury of nervous twigs on the side of the face.

SECTION VII.

Diseases affecting the Labyrinth, or Internal Ear.

Deafness and Tinnitus, associated with affections of the Nervous Centres.

In the generality of cases of deafness hitherto mentioned, the morbid alterations which led to the diminution or loss of audition, commenced in the external or middle ear, or in parts more or less connected with these divisions of the acoustic organ ; and hence, to some extent, their nature and characteristic signs could be determined by the aid of physical diagnosis.

In some of the cases which next follow, affections of the external, or middle ear, have prevailed ; but along with these, other morbid states, apparently telling upon the labyrinth, or internal ear, have also existed ; such morbid conditions require a careful observation of the rational symptoms, viewed in connection with the constitution, the physiological condition, and occupation of

the patient, and aided by an exact and comprehensive history of the case.

In this class of cases, certain aids of physical diagnosis are of importance, with a view to obtain negative information ; thus, it may happen, that, with the help of the tuning fork, it may be discovered that the patient cannot hear sounds carried through the bones of the head, any better than those carried by the atmosphere through its aural instrument, the tympanum ; and, regarding the entire of the body of the patient as an instrument of physical diagnosis, it may be found that his own voice, the action of his heart, the rumbling of his bowels, or the stamp of his foot—in other words, sounds that are conducted through the medium of the body itself—are not any better heard, in cases of complete cophosis, than are the vibrations of sonorous bodies which are carried in the ordinary way through the atmosphere. Such signs, in some cases at least, will help the practitioner to discover that some morbid condition prevails which affects the acoustic nerve, either within the cranial cavity, or within the petrous bone.

Such affection of the acoustic nerve may be unconnected with any disease of the middle or external ear ; and, in such circumstances, the name nervous deafness

has been employed, to designate a case, or kind of deafness, in which the outer ear and tympanum appear to be sound, so that the practitioner is compelled, as it were, to refer the malady to the only part which remains for its location in the auditory organ, namely, the labyrinth, or internal ear, in connection with which the auditory nerve is more especially contemplated.

The practical difficulty which presents itself here, is very obvious. We hitherto possess no means of distinguishing between affections of the auditory nerve within the ear, and those which tell upon the same nerve before it reaches the auditory organ; any vague data which, in exceptional cases, might be met with, would most likely arise out of symptoms produced by some disease, not aural, such as disease of the cerebral mass, of the arteries supplying it, or of the bony case in which it is contained.

The name, "nervous deafness," in the present state of aural pathology, is unquestionably very vague; if it continue to be employed, it might be well to fix its value by suitable definition, associated with an application, well determined, and equally well agreed upon.

The words, *disease of the labyrinth*, or *disease of the acoustic nerve*, would have more of precision than the

expression, *nervous deafness*, which might be understood to apply, in certain cases, to affections of the tympanic plexus, or even of the twigs supplied by the portio dura to the muscles of the tympanum, as morbid conditions of either may affect the sense of hearing.

With the advance of aural pathology, there is little doubt that affections of the brain telling upon the nerve of hearing, affections of the acoustic nerve itself, and diseased conditions of the fifth pair, if not of the portio dura, will all be diagnosed in a more satisfactory manner than they have hitherto been ; and such advances in pathological analysis, if this expression may be employed, may probably lead to improvement in the nomenclature, and nosological classification of maladies of the internal ear.

Cases of congenital cophosis, as well as senile deafness, without any change in the organisation of the ear except what is gradually induced by extreme age, are not to be confounded with those cases of loss of audition, apparently depending upon disease of the internal ear, which may occur at various periods of life, but which seem to be very rare in the young, who far more frequently suffer from maladies of the outer and middle ear.

Tinnitus requires especial attention in connection with many cases of deafness associated with morbid conditions of the acoustic nerve, or of the nervous centres; for the tinnitus, depending on these serious forms of disease, is to be carefully distinguished from those more genuine forms of tinnitus aurium met with in cases where diseased conditions tell *upon*, or extraneous matters interfere *with*, the membrana tympani, the Eustachian tube, the ossicula, or the chorda tympani nerve.

In determining the diagnostic value of tinnitus, the state of the membrana tympani should be very carefully examined, inasmuch as ceruminous deposit on its outer, or mucous accumulation on its inner side, as well as inflammation of its texture, are very common causes of this troublesome affection, which will often be completely removed by freeing the membrana tympani, and the chorda tympani nerve, of all foreign matter which may interfere with them, or by the employment of antiphlogistic means, in cases of myringitis: if after these, tinnitus yet remain, and the outer and middle ear be sound, the state of the internal ear, of the acoustic nerve, and brain, may require particular study.

Deafness. Extreme Concavity of the Membrana Tympani.

Affection of the Labyrinth.

September 28, 1853.—A. B., æt. 35, a married woman, has been deaf thirteen years, and attributes her loss of hearing to “getting cold” from throwing off her cap when heated by hard work in washing. The tick of a watch held close to the ear is heard, but removed three inches away it becomes inaudible ; this is equally true of the left and right sides.

Inflation of the tympanum on either side can be heard with the otoscope ; a little more clearly on the left side.

There is no apparent anatomical change in the external meatus, or membrana tympani, on either side, saving that the membrane of the drum seems to be pushed towards the tympanal cavity, so as to present an unusually concave surface externally.

In connection with the nose, mouth, and pharynx, there is no morbid condition to be noted ; and the case seems to be one of deafness, in part caused by alteration of the structures and canals of the labyrinth.

The extreme concavity of the outer part of the membrana tympani is one interesting feature in the

case: this concavity may have arisen at some former time, in connection with a closed state of the Eustachian tube, or it may have occurred as a consequence of the deposit of lymph in the tympanic cavity; such lymph being supposed to cross this cavity, and to hold on, as it were, by the membrane of the drum on one hand, and by the promontory, or inner wall of the tympanum, on the other. In such a state of things, we have only to suppose a little vital contraction to take place in the plastic material within the drum, to account for the altered form of the membrana tympani.

In the diagnosis of cases of this kind, it is important to determine, carefully, whether any specific form of morbid action may have been associated with the antecedents of the malady; inasmuch as any results of syphilis might suggest a plan of treatment, in other circumstances not called for.

Many instances of extreme deafness, more or less of this kind, have come under my notice, in which, although affections of the tympanum had evidently occurred, there seemed to be good reason for thinking that the membranous labyrinth and the nervous expansions spread upon it had suffered at the same time.

The sudden application of cold, but more especially of cold water, to the head and face, when in a state of profuse perspiration, is often the cause assigned by patients, and apparently with good reason, for this tympano-labyrinthic deafness, if so it might be called, for which, in the early stage, antiphlogistic treatment, with calomel, and counter irritation, seton in the nape of the neck, &c., are occasionally useful ; while at a later period it too often happens that all agents, whether ponderable or imponderable, are equally useless, when employed with the view of restoring audition.

Deafness. Affection of the Middle and Internal Ear.

October 29, 1853.—M. E., æt. 45, the mother of fourteen children, lost a daughter about sixteen years ago, and, in consequence, suffered from long-continued grief, remaining in a very dejected state of mind for the next twelve months ; and it was during this time, and without any apparent cause saving the mental condition alluded to, that deafness gradually came on, which afterwards continued for ten years, without any very remarkable alteration or progress—the patient being, as

yet, able to hear a tolerably distinct and loud voice ; but after that period the defect in hearing began to increase, and became worse and worse for about two years, until loud shouting was required, to make her hear at all—a state of things which has prevailed during the last four years.

About two years ago, menstruation ceased, without any morbid phenomenon of importance.

Habitual constipation has prevailed, and, for more than twenty years, frequent recourse to aperient medicine has been required ; hæmorrhoids have never been complained of.

About two years ago, she was freely salivated for a chest affection, the ptyalism being long continued, and all the teeth, saving two, in the front of the upper jaw, being lost.

Inflation of the tympanum is scarcely audible on either side ; the right membrana tympani is opaque at its margin ; the left membrane cannot be seen, on account of the great curve and small calibre of the meatus.

In such cases the diagnosis is commonly incomplete, and treatment is generally useless.

The physical signs capable of being adequately

determined, certainly do not account for the extreme deafness ; and, even if an affection of the Eustachian tube, as well as of the tympanum, on both sides, exist, this would hardly suffice to explain it, unless we suppose that some alteration affecting the stapes, and its connection with the membrane of the fenestra ovalis, should be taken into account. The loss of audition is greater than that occasionally met with where the ossicula on both sides have come away ; so that the supposition inevitably occurs, that the disease affects the parts intended for the reception of sound, however much those employed in its transmission may be altered.

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1. Deafness, after Measles in early life, much increased after Mental Anxiety. 2. Case of Deafness, cured by Mental Emotion.

October 18, 1853.—Harriet R., æt. 31 years, was married at seventeen, and has had six children ; she had measles at five years of age, which was followed by slight deafness.

Three years ago, she became much more deaf than before, and attributes this unfavourable alteration in her hearing to “ trouble and mental anxiety,” and is not

able to assign any other cause for the increased loss of audition.

The left ear is regarded as the worst ; but the ticking of a watch, pressed upon the auricle, cannot be heard on either side.

The meatus, on both sides, is in good condition, and of large size.

The left membrana tympani has the normal aspect ; the right is of a dull white colour, and apparently thickened ; there are many carious stumps of teeth ; the tympanum, on both sides, can be inflated from the throat.

The patient is of dark complexion and scrofulous aspect ; and the deafness is perhaps in great measure due to changes in the ear, which, in part, took place in early life.

Alterations in the physiological condition of the higher organs of sense which follow great disturbances produced by mental emotion, are especially worthy of attention. We rarely hear of touch, taste, or smell being damaged by mental shocks ; but we do occasionally meet with cases in which sight, or hearing, is unfavourably affected in this way ; for any alteration of an opposite or favourable kind, to be produced by

mental emotion, is an occurrence of the utmost rarity ; but facts show that even this is possible.

Dr. Lancaster, of Liverpool, lately mentioned to me the following very remarkable case :

A wealthy banker, well known to Dr. L., all at once, and unexpectedly, sustained great pecuniary loss ; this gentleman was extremely deaf, and had been so during several years ; but immediately after the commercial shock above alluded to, and during the mental anxiety which followed it, good hearing prevailed, so that friends who had been accustomed to address the sufferer in a loud voice, were surprised to find him requesting them not to do so any longer.

Deafness. Affection of the Tympanum and Labyrinth.

July 15, 1854.—A. B., a man of 48, was formerly cook on board a large American steamer, and in this situation was much exposed to intense heat, and to the evil effects often produced by sudden chilling of the body when profuse perspiration is going on.

He attributes his loss of hearing to these causes ; he is what is often called “ shouting deaf.”

The affection has probably been produced by chronic inflammatory action affecting the labyrinth, and the terminations of the acoustic nerve within it, for air passes through the Eustachian tube into the tympanum on either side ; the external passages and tympanal membranes are healthy, and the degree of deafness is such that the essential parts of the organ of hearing would seem to be seriously affected.

It should, however, be remarked, that the parts within the tympanum, most essential to audition, being also out of the reach of ocular inspection, it is easily understood that changes affecting the lining membrane of the drum and interfering with the functions of the ossicula, and perhaps altering the conditions of the membranes of the fenestræ, should also be taken into the account of probabilities.

This is one of a class of cases elsewhere alluded to, in which extreme deafness is produced by the sudden application of cold to the body generally, but more particularly to the head, previously much heated.

Here the language we are compelled to employ is somewhat interesting, and worthy of a little analysis ; we speak of “ extreme deafness,” being produced, in such cases, without, in many instances, being able to

say with what anatomical changes such deafness is associated.

Corresponding language is not so commonly employed, in speaking of cases of disease of the eye, in which partial or total blindness has been produced by morbid changes in the organ of vision.

In such cases, instead of saying merely that extreme blindness has followed this or that accident, we are commonly able to speak of the visible anatomical changes which have taken place in the eye, and with which the blindness just noticed is associated.

The difference here alluded to, as is quite obvious, arises out of the great difference in the two organs, as far as physical diagnosis is concerned, but more especially with regard to their different capabilities of inspection ; the eye, distended by transparent contents, and presenting a window in front, through which the interior can be seen, allows us to bring into view many of the morbid changes by which its structures may be affected, with or without the “ ophthalmoscope ;” while those taking place in the deeper parts of the ear, are, in great measure, out of sight, and although auscultation be added as a means of diagnosis, it is at best

but a feeble helper ; from such considerations, it is plain that the physical diagnosis of diseases of the ear must always be inferior in precision to that of ocular maladies.

In this case the effects of treatment were not observed ; but there was every reason to think that therapeutic agents would be of little or no avail.

Deafness. Affection of the Labyrinth.

August 16, 1854.—W. W., æt. 48, a dark-complexioned man, from Wales, a mason, "is stone deaf," so that he can only be communicated with by signs.

The left ear became deaf about seven years ago ; about five years ago the hearing on the right side was first complained of, but nevertheless was sufficient for ordinary purposes, while the left side deafness was complete.

About three weeks ago the deafness became complete on the right side, in consequence, as the patient believes, of taking cold.

Tinnitus and dizziness are both troublesome.

The membrana tympani is opaque on both sides,

but of darker colour, and less normal appearance, on the left than on the right side ; on both sides it is concave externally ; the Eustachian tube is pervious on both sides.

The patient suffered much from piles about nine years ago, but has not lately been afflicted in this way.

The abnormal condition of the tympanal membranes does not account either for the degree of deafness, or the general aspect of the patient ; he is thin, feeble, and tottering ; the tongue is furred, the pulse small, with depressed state of mind, together sufficient to suggest the idea that chronic cerebral disease is going on, along with which, the cranial, or aural part of the acoustic nerve may suffer.

A seton in the back of the neck was worn during seven weeks ; the patient thinks, with decided benefit to the hearing, as well as to the general health. He can hear noise, but cannot distinguish articulate sounds ; however, the improvement in audition, to which he directs attention, does not appear to be very striking.

The occupation of this patient of necessity exposes him to great and frequent vicissitudes of weather ; hence possibly the diseased conditions of the tympanum and labyrinth, which may be looked upon as, in great measure, accounting for his deafness.

February 10, 1855.—Having been called to see this patient on account of a fracture of the leg which he unfortunately met with, being knocked down in the street by a carriage, the approach of which he did not hear, I was glad to find that all his cerebral symptoms had vanished, and that his general health was better than before, but the hearing did not appear to have undergone any remarkable alteration.

In this case, it is probable that morbid changes in the tympanum and labyrinth, if not within the cranium, are associated with the remarkable loss of audition from which the patient suffers ; these changes, however, are out of the reach of physical diagnosis, and are but imperfectly interpreted by rational symptoms.

Deafness, preceding Epilepsy and Apoplexy.

October 27, 1853.—J. W., æt. 38, a strong man, enjoyed perfect health until the age of about thirty-six, working very hard as a bricklayer, and being much exposed to wet and cold.

He had an epileptic fit in the night after the 23rd February, 1852, which his wife discovered from the

sudden shaking of the bed ; he was yet in convulsions when she saw him, and was bleeding at the mouth ; after seven days, he had another fit ; and after seven days more, seven fits occurred in one day ; leeches were now applied to the head, and the fits did not return for three months, after which they returned, and gradually increased, in frequency, from twice or three times a week to once a day, and at times more frequently.

After the epileptic fits had continued about eight months, right-side hemiplegia came on, the leg being disabled now and then, after very bad fits, but regaining its power in the course of a few hours ; the hand was completely paralysed until about three months ago ; during the last three months its muscular power has gradually returned, so that at present he can seize and grasp with it pretty strongly.

The accompanying facial paralysis was attended by difficulty of mastication, occasional escape of the food from the right side of the mouth, inability to close the right eye completely, with frequent and severe frontal headache.

Before any symptom of epilepsy had occurred in this case, deafness had been complained of ; and the wife of the patient states that she noticed his becoming gradu-

ally more deaf during about two months before the first epileptic fit.

In some cases of hydrocephalus in children, deafness is a remarkable feature ; in this case cerebral effusion may have taken place ; while other causes, such as exostosis, tumour, softening of the brain, disease of the auditory nerve, &c., may be at hand ; the following remarks, however, will unveil, at least in part, the cause of the deafness.

There is no trace of the membrana tympani to be seen in either ear, the deeper part of the meatus, for at least half an inch, being closely packed by hard and black cerumen—the adherence of which to the membrane of the drum, and its impaction in the neighbouring part of the canal, were sufficient to prevent its being removed with facility ; when, however, it had been completely taken away, and the exposed surfaces well cleaned, the tympanic membrane was clearly seen on both sides, opaque and white at the lower part, but vascular, and of a pink colour, at the upper.

The deafness was lessened, but not altogether removed, by clearing the external meatus, and thus allowing sonorous vibrations to play upon the membrana tympani.

Such facts illustrate the importance of distinguishing between coincidence and cause. The head affection, in this case, seemed to tell upon the hearing; but the morbid condition of the external meatus, and of the membrana tympani, requires its own share of consideration.

There is a very interesting class of cerebral diseases, the graver phenomena of which are often preceded by disturbance in the functions of the higher organs of sense; thus, in practice, we occasionally meet with cases of apoplectic attack, without any premonitory sign which has attracted attention, saving deafness, which may gradually increase, for a considerable time, before the occurrence of the fit. This remark may be illustrated by the following case:

Mr. A., æt. 55, of slender frame and regular habits, and lately in his usual health, fell down in a fit of apoplexy immediately after eating a hearty breakfast; the paralytic shock was the most general and complete that could be imagined; nothing seemed to live except respiration and circulation; and these were much disturbed until the time of death, which occurred on the third day.

For several months before, deafness had been complained of, and during the previous two months, it had

become much more distressing. Autopsy could not be obtained.

In the case of a gentleman lately under my care, on account of a severe mental affection, the only premonitory symptom was deafness on one side.

Deafness of long duration and gradual occurrence.

Family Deafness.

October 12, 1854.—S. E., æt. 45, the mother of five children, has been deaf during the last twenty years ; on each side, for the tick of a watch, the hearing distance is two inches ; the occurrence of the deafness was gradual, and the cause is not assigned by the patient. She is a country woman, a hard worker, and much employed out of doors ; and we often find that such people take no very refined care of themselves, being regardless of atmospheric changes, that the more wealthy and sensitive would commonly avoid. The females of this class, during gestation, but more especially at the period of parturition, to say nothing of that of lactation, which is often very long continued, are much exposed to the sources of aural

disease, at times when the constitution is less able than usual to resist their influence. These considerations suggest the thought, that a wider-spread knowledge of "the laws of health" would be a great boon to the industrious classes of the community.

In such cases the deafness is now and then increased by ceruminous accumulation, or by catarrhal and guttural affections; such additional sources of impaired audition require attention—and treatment, in such circumstances, may be followed by some amendment in the hearing—the main deafness, depending on anatomical changes of long standing, all the while remaining unaltered.

The only anatomical alteration observed in this case was, an opaque state of the membrana tympani, on both sides; this membrane appeared white, and as if thick and leathery.

The external meatus was in normal condition, and the Eustachian tube pervious on both sides.

In such a case, it is probable that the morbid alteration is not confined altogether to the membrana tympani; the lining membrane of the drum, generally, or the membranes of the fenestræ, may have shared the anatomical changes which have taken place—to say

nothing of the condition of the labyrinth, the state of which is so completely out of the reach of physical diagnosis.

But little benefit can be expected from treatment in cases of this kind. In most instances, such deafness is the result of chronic inflammatory action, which has produced morbid alterations in the middle ear, if not in the labyrinth as well ; and these, as in the case just cited, have often been of long duration, before remedies are sought or employed.

In a practical point of view, it is worthy of remark that females now and then first complain of this kind of deafness after throwing off the cap, or other articles of head-dress, at times when profuse perspiration is going on ; and other cases related in these pages tend to show that the danger to hearing is increased, if, under such circumstances, the head and face be freely washed with cold water.

In this case an early, active, and persevering treatment, while yet the affection was telling mainly upon the middle ear, might have been followed by beneficial results.

This patient has one sister and one brother, and both suffer from defective hearing ; and it may be

stated that the knowledge of such a fact is of some importance in a practical point of view ; it suggests the idea that there is a predisposition in the family to morbid changes in the auditory organ, and this fact, taken together with the long duration of the deafness of the sufferer, affords sufficient reason for giving a very unfavourable prognosis.

A lady of thirty-eight, now under my care on account of deafness, without any appreciable alteration of the external, or middle ear, or of the membrana tympani, has already been deaf several years ; her sister, younger than herself, has also been deaf some years, and requires loud shouting to enable her to hear at all ; their mother was extremely deaf for several years before her death ; and, at present, a nephew of ten, and a niece of six, children of their brother, are both suffering severely from ear affection, after scarlet fever ; the former, with otalgia, without deafness, and without otorrhœa ; the latter, with otorrhœa, and paralysis of the portio dura. These associations, taken together, tell very unfavourably upon prognosis in the case of the lady first mentioned.

Deafness after Syphilis. Probable Affection of the Labyrinth.

October 6, 1853.—A. D., æt. 36, has been blind from amaurosis during the last two months ; and amongst the most important antecedents of her complaints, an attack of syphilis must be mentioned, from which she found herself beginning to suffer about six months ago, having been married to a second husband about three weeks previously.

The first appearance was a chancre on the left side of the vulva ; next, a bubo in the left groin, about a month later ; and, two months after the bubo, a cutaneous eruption, which first affected the nates and lower part of the trunk, and afterwards spread over the body generally.

Deafness, on both sides, has come on within the last month, during the last half of which the weather has been windy, rainy, and cold ; and while the deafness has been increasing, the blindness has become more extreme.

In this case the deafness seems to depend in part upon alterations which have probably taken place in the labyrinth, more or less analogous to those which have affected the eye. The defect in hearing was

somewhat relieved by clearing the surface of the membra *tympani* of a ceruminous accumulation, which coated it in both ears.

It is of course impossible, in such cases, to be perfectly satisfied that the diseased conditions are confined to the labyrinth, or that the tympanum is free from disease, as neither one nor the other can be made the subject of inspection ; when, however, the membra *tympani* appears sound externally, when the tympanum can be inflated from the Eustachian tube, and when the disease appears to have started from within, and not from without, or from external influences, the probability of affection of the labyrinth is suggested.

In this case, although the patient at one time suffered from an extensive cutaneous eruption of syphilitic character, it did not affect the auricle or external meatus on either side—so that the malady did not seem to be translated from the skin to the aural apparatus ; and there was no complaint in the throat to be carried onwards by the lining membrane of the Eustachian tube ; hence the deafness may be diagnosed, as arising in the labyrinth, and thus the expression, starting from within, may be excused.

After clearing the external meatus, the membrane of the drum did not appear to be diseased—on either side.

In this case a mercurial course, another of iodide of potassium, and sarsaparilla, with counter-irritants, and all requisite attention to the general health, were of no avail.

It is remarkable that the morbid action should have singled out for its victims the functions essential to vision and hearing, doing relatively little harm to other parts; and it is worthy of notice, that it does not seem to have attacked the mucous membrane either of the eye or ear, but rather the finely organised membranes, of the serous character, which belong to the closed cavities of both.

Deafness, after Onanism.

September 16, 1854.—Mr. O., æt. 21, a fine-looking, fair-complexioned youth, says that he went to a boarding-school at the age of eleven, and, like many of his schoolfellows, practised masturbation, at the age of thirteen, and continued this bad habit until he was about seventeen, and that during this time the

practice in no way affected his health ; he says, "I dont know that I had so good a memory as some, but I was very quick in learning, so that my mind did not appear to suffer much."

At fifteen he left school, and was apprenticed to an ironmonger, continuing the masturbation till the age of seventeen, as above stated, and without feeling any serious inconvenience until the age of eighteen, when he began to be "very nervous," and felt much embarrassed when waiting on customers in the shop, "especially if they were ladies ;" at this period, also, he found that ordinary toil was followed by extraordinary fatigue.

At seventeen the onanism was discontinued, but nocturnal emissions have ever since distressed him ; whenever he passes a week without them, which is very rare, the improvement in general health and feeling is very great. About two years ago, he began to suffer from what he calls nervous deafness, which has ever since gradually increased, so that he is now seriously inconvenienced by it ; the organs of hearing do not display any signs of anatomical change.

This form of deafness is now and then met with in cases where onanism has been practised ; and if

patients could, without inconvenience, do any thing which a medical adviser might be disposed to recommend, it is evident that in all cases bad habits must first be left off, and, in many, early marriage, and rural and invigorating occupations, would next be suggested.

Deafness after Onanism.

December 3, 1854.—Mr. T., æt. 29, practised masturbation from the age of fourteen to that of twenty-one; at twenty one he left it off, but has ever since been troubled with nocturnal emissions, eighty of which occurred during one year, or between August 4, 1853, and August 2, 1854; “the discharge generally happens between three and five o'clock in the morning, or after the first sleep.”

Constipation prevails, but the principal suffering of the patient is caused by extreme mental depression; bodily and mental energy are both enfeebled in an extreme degree.

A watery state of the conjunctiva is also very troublesome.

Deafness within the last eight months has been

much complained of, although the aspect of the external meatus and membrana tympani is quite normal, and the entrance of air to the tympanum can be distinctly heard.

This deafness would seem to be of cerebral origin ; it is accompanied by tinnitus, complained of as "roaring, buzzing, and blowing sounds," for the relief of which it is evident that local treatment alone would be of little avail.

A course of chalybeate tonics was recommended, to be accompanied by good diet, moderate exercise of body and mind, and very early hours of rising and retiring to rest—and in about a month after the commencement of this plan of treatment, a very marked improvement in the condition of both body and mind was observed ; the tinnitus became less troublesome, and the hearing was considerably improved.

The serious affection of the nervous centres, in cases of this kind, should never be lost sight of ; the general treatment is always important, and occasionally local treatment, directed to the spinal cord, may be employed with advantage ; and it need scarcely be mentioned, that topical applications to the organ of hearing could rarely be supposed capable of doing any good.

The persevering employment of imponderable agents, in such cases of deafness, seems worthy of notice in this place.

Galvanism has been strongly recommended by some in cases of "nervous deafness;" it has been frequently employed, and has often failed to produce any favourable change; but in connection with such results, it should also be stated, that the employment of such an agent, indiscriminately, in the various kinds of deafness, would, for the most part, be followed by disappointment alone; no one could expect that hearing, lost from perforation of the membrana tympani, from caries of the temporal bone, or even from occlusion of the Eustachian tube, or such like mechanical or anatomical alterations, would be regained by shocks of electricity; nevertheless, it would seem that cophosis, depending on any condition of the nervous system of the ear, allied to paralysis, and not associated with inflammatory action, might very fairly be submitted to the rousing influence of electrical agency; and some interesting cases of nervous deafness, treated with success by Duchenne, and published in his recent work, tend to place this matter in a better, more interesting, and more scientific light, than any in which it has hitherto appeared.

It is obvious that, in cases of deafness following the practice of onanism, the nervous centres generally, as well as the nervous system of the ear in particular, should receive the influence of the imponderable agent employed ; and galvanic shocks, directed through the length of the spine, may be regarded as in some measure worthy of recommendation.

Co-existing disease of the Tympanum and Labyrinth.

In patients of serofulous constitution, more frequently, perhaps, in the young, we occasionally meet with the most extreme deafness associated with alterations of the membrana tympani, the visible affection of which, in such instances, is often to be regarded as the mere exterior display of a malady affecting the lining membrane of the drum and its appendages, so as to destroy, in great measure, the function of this important part of the acoustic apparatus.

Thickening of the mucous membrane, associated occasionally with the growth of soft excrescences, which occupy a considerable part of the tympanic cavity, and interfere with the anatomical condition and the physiological actions of the ossicula, their joints,

ligaments, and muscles, is but too often connected with this strumous form of chronic otitis.

It would be difficult to suppose that in such cases the structures of the labyrinth could possibly escape intact, or that we should find the membranes of the fenestræ in their normal condition, if we could have a view of them from the labyrinth side ; their condition, no doubt, approaches, as far as their mucous side is concerned, to that observed in connection with the mucous surface of the membrana tympani, and of the remainder of the tympanic cavity ; while the anatomically delicate character of their labyrinthic surface forbids us to suppose that this face of these two membranes will have remained in the normal condition, while such serious changes have been progressing in the surrounding and associated structures.

The complete cophosis, or extreme deafness, which often prevails in such cases, might suggest the idea that the affection depended on some serious lesion of the auditory nerve, or of the brain, if we did not closely attend to the state of the membrana tympani, and bear in mind the important fact that the diseased appearances seen in this membrane are to be considered as a small part of a widely spread morbid condition,

the greater portion of which is hidden from view in the anfractuosities of the tympanum and labyrinth.

An interesting case lately came under my notice, illustrating in a remarkable manner the statement which has just been made.

The patient, in this case, is a young lady of 17, whose aspect and conformation are strongly marked by the characteristics of serofula: about two years ago she was first under my care for a serious form of strumous ophthalmia, from which she recovered, but which, on one side, troubles her again at present.

About three months ago she became "a little deaf;" to this, however, but little attention was paid—the sight being thought of great, the hearing of comparatively little, importance.

From the appearance of matters when the ear was first examined, it was evident that disease of the tympanum existed, and that it had already been of long duration; the membrana tympani had lost its normal form, instead of which a very irregular and puckered appearance was observed, with complete opacity, of a dull, or dirty white colour, and the general aspect of its texture was that of a soft, half rotten part, through which air or water might be driven, if sent with any

considerable force ; aperture in the membrane was not seen, although it might exist, or, after previously existing, might have become closed. The entrance of air to the tympanum could not be distinctly heard with the otoscope on either side ; but there is not any enlargement of the tonsils, or other morbid condition met with in the visible parts of the throat.

In this case it is probable that there exists a serious and extensive alteration of the lining of the tympanum, as well as of that of the Eustachian tube and mastoid cells ; and there is reason to think that the delicate structures of the labyrinth will not have escaped the influences of the morbid action, which doubtless commenced in the tympanic or mucous division of the ear.

The importance of a careful observation and study of the condition of the membrana tympani is very obvious in instances of this kind, where the auricle displays no morbid appearance, where the deafness is occasionally so extreme that loud shouting cannot be heard, and where the patient, having that inanimate aspect so often associated with complete cophosis, might, at first sight, be supposed to suffer from paralysis of the auditory nerves, depending on some serious organic lesion.

The importance of early treatment in such a case cannot be more obvious ; for, where we have *scrofulous disease* within the petrous bone, on both sides at the same time, there is a sort of double danger to life, as well as to hearing, from the probable occurrence of caries or necrosis, or of affections of the brain and its membranes, with, or without, such important changes in the osseous structure of this part of the cranium.

Effects of Injury.

Disease of the internal, as well as of the middle ear, is now and then met with as a consequence of accidental injury to the auditory organ ; in one instance, in my neighbourhood, there was a total loss of power in the muscles of one side of the face, loss of the whole of the membrana tympani and of the ossicles, and complete cophosis, with thickening of the lining membrane of the tympanic cavity, all of which followed the introduction of a small and hard body into the external meatus, and the efforts employed for its extraction ; in this case there is little doubt that the internal ear shared the consequences of the injury done within the external meatus and tympanum.

The tympanum was emptied of its contents; function was therefore lost along with structure; the after process was a diminution of the size of the tympanic cavity by thickening of its mucous membrane, and it is not improbable that the same kind of morbid process occurred within the cavities or canals of the internal ear, after destruction of the membrane of the oval opening, perhaps also of that of the fenestra rotunda.

Long continued Disease of the Tympanum, without important alterations of the Labyrinth. Difference in the state of the two Ears. Interesting effect produced by covering the Aperture in the Left Membrana Tympani.

In the last mentioned case, there is every reason to think that the inflammatory action which followed the injury would affect the greater portion of the petrous bone, and must hence tell unfavourably upon the different structures of the labyrinth, as well as upon those of the external meatus and tympanum, thus differing materially from the following case, which supplies a source of contrast, in a practical point of view, both interesting and important.

In one case we have, perhaps, the whole of the

auditory organ injured ; in the other, the injury is mainly confined to the tympanic, or mucous system of the ear ; in one case, audition is destroyed—the function of the labyrinth being lost ; in the other, hearing is only diminished —the function of the tympanum being in part lost.

Mr. T., æt. 42, has suffered from deafness during the last thirty years. On the right side the membrana tympani is lost, and the mucous membrane of the tympanic cavity thickened ; on this side the tick of the watch is heard “ generally about a foot from the ear,” while, on the left side, the hearing distance for the tick is not more than one inch ; on this, the left side, an aperture is seen in the upper and outer part of the membrana tympani ; air is easily blown from the throat to the exterior, on both sides.

A small pellet of oiled cotton being applied to the aperture in the left membrana tympani, the hearing distance is at once extended to three times its previous range. Other obturators had not the same effect in improving the audition.

In this case a remarkable elongation, with thickening and redness of the uvula, prevails ; the soft palate partakes of this state of chronic inflammation, spoken

of by the patient as having followed a bad attack of cold, from which he suffered about two and a half years ago.

Three leeches were applied to the integument of the throat, with the hope of diminishing the extreme vascular congestion of the mucous membrane of the soft palate, and neighbouring parts.

It is of no small importance to attend to the condition of the mucous membrane of the throat in cases of this kind, for when we bear in mind the very small size of the tympanic cavity, we see at once the importance of not permitting this space to be rendered smaller, or entirely obliterated, by thickening of its investing tunic, which might occur by extension of morbid action from the mucous surfaces of the throat to those of the Eustachian tube, tympanum, and mastoid cells; so that, in reality, the treatment of the mucous membrane of the throat and ear, in such instances, is often the great therapeutic consideration to be attended to, whether viewed in connection with the improvement of the tympanum, and the increase of the power of hearing, or looked upon as the means of preventing a dangerous continuation or extension of morbid action, in cases where hearing is lost from

disease already existing in the labyrinth, which may have abnormal communication with the middle ear, so as to partake more or less of the effect produced by all morbid changes occurring in the mucous division of the acoustic organ; for when once disease of the ear has passed inwards beyond the boundaries of the mucous lining of the tympanum, the dura mater on the cerebral surface of the petrous bone is very near at hand, and danger to the brain not very distant.

It is, however, most encouraging to bear in mind that disease, or the effects of disease, may exist in the tympanic cavity for a long series of years, without going beyond the range of this space so as to affect the labyrinth or injure the intra-cranial structures; of this truth we have a very marked illustration in the case of Mr. T., just related, and its contemplation seems to be well worthy of attention, more especially in connection with tympanic disease occurring in very young patients.

Two questions suggest themselves, in connection with the interesting case last related.

1st, How is it that the hearing is *less damaged* on the *right side*, where the *membrana tympani* is lost, and the deafness *so great* on the *left side*, where

this membrane is found *in situ*, but perforated by a small aperture?

2nd, How is it that the little mass of cotton applied to the aperture in the left membrana tympani does so much good, while any obturator passed down to a corresponding site at the bottom of the right meatus is of no use?

Imperfect answers to these questions at once present themselves to the mind, but satisfactory physiological explanations cannot be arrived at, inasmuch as the state of the *fenestræ*, and of any part of the chain of ossicula which may remain, as well as the condition of the membrana tympani, should be taken into account in the comparative estimate of the state of structure and function of the two ears; and this cannot be done in the actual state of parts, some of the more important of which are incapable of being illumined or brought into view.

When the membrana tympani is entirely lost, so that the cavity of the tympanum only lengthens out, as it were, the tube of the external meatus (which, in such a state of parts, may be said to extend from the concha without to the promontory of the tympanum within), the outer portion of the chain of ossicula, if

not the whole of this chain, must be lost, so that we have no malleus to act upon the membrane, nor membrane to throw the influence of its vibration into the malleus, and the other bony links beyond it; hence, the small dossil of cotton, sometimes so useful when applied to the outer aspect of a perforation, such as that alluded to above (apparently by supporting, in some degree, the membrana tympani, and, at the same time, partly closing the tympanum, so as to prevent the current of air readily entering it from the concha, and thus in some measure imitating, as it were, the normal state of the parts), cannot well have a precisely corresponding function where there are no remains of membrana tympani to receive it, or to be supported by it. The dossil of cotton, so useful in the last mentioned case, is merely, as it were, an obturator or stopper for the aperture against which it is placed; its good effect being lost as soon as it falls away from the perforation in the membrane of the drum.

It should be borne in mind that the sound condition of the membrana tympani and malleus is less essential to hearing than is that of the membrane of the oval opening, and the stapes, and that while the former, in

many cases, may be well observed, of the latter this cannot be said. The ear may be good, or little damaged, about the site of the membrana tympani, while it may happen that greater mischief has occurred within the drum, or about the site of the oval opening ; but the contrary may be, and seems to be, more frequently the case ; such considerations, taken along with others that relate to the many and various ways in which the hearing may be injured, throw some light on the different conditions of the two ears in cases such as the one just passed in review.

On the employment of the Tuning-fork and Ear Trumpet in the
Diagnosis of affections of the Tympanum and Labyrinth.

Allusion has been previously made to the utility of negative information in certain cases, where there is doubt as to whether or no disease of the labyrinthic or more essential part of the ear prevails ; valuable information of this kind may often be obtained with the aid of the tuning-fork, and the ear trumpet.

In many cases of very serious deafness, where the tympanum seems to be the main seat of morbid action, or its consequences, a trial of the audition of the patient

with the aid of the ear trumpet will often shew that this artificial mode of increasing the effect of sound is sufficient to produce distinct hearing, and thus to prove that the nerve of hearing is not damaged, but that it lacks the aid of a normal condition of the middle ear, for which the artificial tympanum (if so it might be called), or ear trumpet, is the most efficient physical substitute.

Looking into the external meatus, in a given case, every thing may appear normal (saving, perhaps, a slight tinge of opacity in the membrana tympani); the otoscope being applied, the Eustachian tube may be found quite pervious; the ear trumpet being employed, the deafness may vanish; so that, *par voie d'exclusion*, we throw out of the inquiry the elements which seem not to belong to it—such as the external meatus, the Eustachian tube, and labyrinth (or acoustic nerve); and this exclusion of the non-essentials leaves us the drum of the ear (or more especially its mucous membrane) which is the common seat of disease in cases such as are here alluded to, and should therefore be regarded as the more essential object of inquiry, as far as the local or ear affection is concerned. In such instances, it is well to look upon the lining membrane

of the tympanum as a sort of conjunctiva of the middle ear, connecting it with the throat—with the external meatus, through the medium of the membrana tympani—with the labyrinth, through the medium of the membranes of the fenestræ—with the mastoid cells, by continuity of surface, as well as with the ossicula, their ligaments, and muscles—and, not least, with the chorda tympani nerve, and the tympanic plexus; so that the simplest anatomical view of the connections of the membrana cavitatis tympani shews that it could not be inflamed, or thickened—that it could not secrete pus, or even an inspissated mucus, in large quantity—that it could not undergo any process of morbid degeneration, from granular, fungoid, polypoid, or other growth, without the faculty of audition being seriously disturbed; in short, the healthy state of this conjunctiva of the ear is essential to the normal function of the auditory organ, just as much as the healthy state of the conjunctiva of the eye is essential to the agreeable exercise of normal vision.

No further proof is wanting of the great importance which should be attached, in the diagnosis of diseases of the ear, to the state of the mucous membrane which extends from the back of the nose, through the

Eustachian tube and tympanum, into all the anfractuosities of the mastoid cells; and this *great extent* of the membrane should ever be kept in mind; for that part of it which lines the small cavity of the tympanum is, of necessity, of *very limited extent*, so that the little drum of the ear is soon choked up by the products of morbid action, when such action affects the whole of the mucous lining of the middle division of the auditory organ, and thus we are prevented hearing sounds until the more active stage of such an attack of otitis or tympanitis has passed away, after which more or less deafness commonly remains, saving in cases where the mucous membrane of the middle ear, and the parts with which it is immediately connected, regain their normal condition.

In cases of deafness of this description, when the tuning-fork and ear trumpet are carefully employed, it will often be found that the acoustic nerve has not undergone any appreciable alteration—distinct hearing being enjoyed as soon as the ear trumpet is brought to its aid, while the vibrations of the fork are distinctly heard when carried through the bones of the head.

Hearing through parts of the Skull where the Bone is deficient,
or through Apertures left by the Trephine.

Although, in many cases where deafness prevails, without serious injury of the acoustic nerve, the vibrations of the tuning-fork are readily heard through the bones of the head, it is interesting to know, that often such vibrations are still better heard over certain parts of the cranium where the bone may be deficient, as in instances where patients have previously lost a portion of the skull from disease, fracture, the application of the trephine, &c.

Through the cicatrix, in cases of this kind, noise is often painfully heard by the patient, if the portion of the skull where the bone is deficient be not completely covered by some solid body; and when the ear of the observer is applied near to such a cicatrix, "it is forcibly struck by the sound of the voice of the patient when he speaks." If the ears of the patient be stopped, he hears the tick of a watch held over the cicatrix, without its touching the hair.

In the experiments of Larrey and Savart, made upon patients who had previously been trephined, the

ears being stopped, questions were put by speaking immediately over the depression of the cicatrix ; each question was heard, and readily answered ; but when the cicatrix was covered by folds of linen, or by the palm of the hand, there was no sign of hearing when the patient was spoken to over the cicatrix as before. Sounds seemed to be even more distinctly heard by these patients when directed through a small and hollow cylinder of wood, expanded into a hollow cone at each end (like the chest end of the stethoscope), and placed between the mouth of the speaker and the cranial cicatrix of the patient, or listener.

These phenomena were observed by Larrey, in connection with cicatrices at the anterior part of the head, and which did not contain bony matter ; the same results were not obtained in cases where the hinder part of the head had been trephined.

It is not very probable that such observations will ever lead to any new operation for the relief of deafness ; to attempt to carry sound to the internal ear by way of an opening made in the skull (however it might afterwards be closed), would be to travel by a somewhat unsurgical and dangerous route, even in cases of “deafness independent of the nerves,” alluded to

by Itard, as those where, in extreme circumstances, such a proceeding might be thought of.

Hearing by way of the fontanelle, previous to its complete closure, or through the thinned parieties of a skull after previous suffering from hydrocephalus, are matters which might be found worthy of attention ; the former more especially, in connection with the testing of audition in very young patients, who may be supposed to suffer from congenital deafness ; but it should be added that the difficulties of the inquiry are more obvious than is the value of any probable results. An interesting case, bearing upon these remarks, will be hereafter related.

Otalgia. Nervous Otalgia.

Neuralgia, or Tic-Douloreux of the Ear.

Neuralgia of the Right Tympanum, accompanied by Neuralgia of the Sole of the Right Foot.

Diseases of the ear are often attended by considerable pain ; this pain, in cases of internal otitis, or inflammation of the structures within the tympanum, but more especially of its lining mucous membrane, is often severe, continued, dull, heavy, and throbbing ;

in neuralgic affections of the auditory organ it is commonly intermittent, occurring in paroxysms of extreme severity, frequently of short duration, and with intervals very variable in length, now and then prevailing during the day, and leaving the patient quiet for the night, and, in this respect, differing from the kind of suffering observed in some cases of inflammation or purulent collection within the tympanum ; these are not unfrequently accompanied by dire nocturnal agony, which, too often, racks the patient during the greater part of the night, and only ceases, or becomes more bearable, or permits of sleep, as the dawn approaches.

A very interesting case of neuralgia of the tympanum, or tic dououreux of the ear, has lately come under my notice, in a young gentleman of 10 years of age. The patient is of a highly nervous temperament, sensitive and excitable, characterised by fine cerebral development, and very superior intelligence. The painful affection of the right ear, from which he now suffers, followed an attack of scarlet fever, which he had about seven months ago.

Watching the case attentively, a few days since, it was observed that a violent, although momentary attack of pain, occurred nearly every five minutes ;

occasionally the interval was less, sometimes a little more ; the pain is most lancinating and acute, causing the patient to jump up from his chair, and often to bound across the room, and to throw himself into the arms of his mother in the most frantic manner imaginable. As soon as the shock of pain is felt, a blush of redness displays itself on the external ear, which gradually passes off before the next paroxysm occurs. The attack of pain is remarkably sudden, and its cessation is equally so, and it is particularly worthy of notice that the patient is in an instant completely freed from his agony, and at once resumes his previous occupation or amusement, as if no recollection continued of the writhing torture which has just passed off. This sudden attack, and as sudden arrest of the pain, are very unlike any of the ordinary phenomena of otitis, and are not accompanied by the anatomical appearances or physical signs which characterise inflammatory affections of the ear.

The Eustachian tube is pervious on both sides, the entrance of air to the tympanum being distinctly heard with the otoscope, both in the act of swallowing and in that of forced expiration, during the closed state of the nose and mouth.

The external ear, meatus, and membrana tympani do not betray any morbid appearance which would of itself attract attention at present. A few months ago, or soon after the recovery from scarlet fever, a slight opacity of the membrana tympani was observable, and the neighbouring, deeper, or bony part of the meatus, was a little narrowed by thickening of its lining membrane, which, as it would seem, had occurred as a consequence of otitis, telling at the same time upon the structures of the middle ear, the membrana tympani, and the lining of the external canal. In the nose, mouth, and pharynx, there are no morbid appearances.

The intelligence of the patient is perfect, and, hitherto, the abnormal condition of the suffering part does not seem to have told upon the brain, or upon any other intra-cranial structure connected with it. Although disease of the temporal bone, periostitis, meningitis, tubercular, purulent, or other deposit, caries, or necrosis, breaking up of the chain of ossicula, &c., might, in such a case, be feared, as part of a host of possible evils, either existing before the commencement of the otalgia, or, in some measure, produced during, and in connection with its progress, there does

not seem, at present, to be any clear indication of the existence of any of these.

It is worthy of notice that on the father's side of this young gentleman's family, ear disease and extreme deafness prevail, more especially with the female members of the family, in whom cophosis occurs, in connection with alterations of the lining membrane of the tympanic cavity, but without any painful affection of the auditory organ; while, in the case of the patient, there is good reason to think that morbid alterations which have, some months ago, told upon the interior of the drum, are to be viewed in connection with the severe and distressing affection just described.

The nervous character of this case is rendered still more probable by the fact that a neuralgic affection of the sole of the right foot has lately come on, in addition to the aural malady of the same side; and it is especially worthy of remark that the paroxysms of pain occur simultaneously in the foot and in the ear, so that the patient is at the same moment seen suddenly to apply one hand to the ear, while with the other he seizes the equally tortured foot. Since this patient came under my notice there has not been the

least trace of otorrhœa, and, although the friends allude to some “discharge from the ear” as having occurred while the little boy suffered from scarlatina, this appears to have been so very slight that we cannot obtain any very positive information respecting it.

In this instance hygienic attentions and therapeutic agents have not had much success; local depletion by the application of leeches, counter-irritants, aperients, sedatives, iodine, tonics—such as iron and quinine, &c., &c., have been employed, in accordance with indications from time to time apparent during the last five months of the progress of the case; but no one remedy, nor any combination of remedies, can be said to have been attended or followed by any diminution of the sufferings of the patient, increase of his strength, or other kind of amelioration.

A removal from the north to the south of England, a stay of some weeks in the county of Middlesex, and a return to the north again, with considerable variations in temperature and scene, and also in diet and manner of living, accompanied by a variously modified medical treatment, were all resorted to, but the affection retained its rebellious character, even up to the beginning of the month of August, or about half a year from the time of its commencement, when a dawn of improve-

ment appeared ; the intervals between the attacks of pain became longer, and the paroxysms seemed less severe, while it became more and more obvious that the extreme and affectionate attentions of which the little sufferer had been the subject ought to be made less apparent, lest his sensitiveness should be further exaggerated by the influence of a constant sympathy ; more especially as it had been long supposed that the patient sometimes “made too much” of his attacks, and, upon the whole, did not seem to suffer in his general health as much as might have been expected from the vast amount of torture which he seemed to endure.

This may certainly be regarded as a marked instance of pain in the ear, without any appreciable symptom of existing inflammation ; it has been stated that such cases do not occur ; rare, however, as they may be, that they are occasionally met with there is no doubt.

The hearing in this case is not much affected ; on the sound side the tick of a watch is distinctly heard when held about a yard from the ear ; it is also heard on the affected side, but at a distance little exceeding one foot ; this fact seems to favour the idea that hitherto serious organic change has not taken place, but that the seat of the pain is in the tympanic nerves ;

and there is little doubt that the lining membrane of the drum reddens under the influence of each shock of the pain, at the same moment when the blushing of the auricle is so strongly marked.

Speaking generally, the malady seems to belong to affections of the nervous system of the ear; not, however, to those of the internal ear; for the slight degree of deafness observed is probably associated with some degree of thickening or other alteration of the lining membrane of the tympanum, and it is impossible to say whether some morbid alteration of a nervous twig, or some deposit (capable, perhaps, of gradual absorption,) in its neighbourhood, may not be the hidden source of the suffering above described. That anti-phlogistic treatment was not found useful, was settled by most careful observation; and the improvement which seems now to be taking place occurs after the use of invigorating remedies, good diet, and all the requisite attentions to the general health.

Since the above was written the recovery has gone on favourably, and the intervals between the paroxysms, before noted in minutes, are now measured by hours; and, at times, nearly a whole day will pass without an attack of pain.

SECTION VIII.

Deaf-Dumbness. Mutism.

MUTISM, in those who hear, may be associated with defective intellect, depending on some abnormal condition of the nervous centres ; or it may be the result of want of due power in the organs of speech, or in the nerves which supply them ; in the former condition, the patient is unable adequately to appreciate the sounds which he hears, or the circumstances connected with them ; in the latter, the condition of his organs does not allow him to imitate these sounds ; both which causes of mutism are comparatively rare ; the most common cause of dumbness being deafness, either congenital, or acquired in very early life, for speech being an imitative art, the sounds of which it is composed must be perceived, in order to be imitated, and hence the want of the art in those who are deprived of the advantages and pleasures supplied by a perfect instrument of audition. Formerly, it was supposed that the

organs of speech were paralysed in these cases, but modern pathology no longer blames the tongue, where the ear alone is at fault.

Mutism may be linked with more than one of the causes alluded to above. Where the hearing is good, it is now and then not easy to determine whether mutism depends upon defective power of utterance, or want of intelligence, or upon both.

In some instances we meet with partial defects in the art of speaking, where complete mutism does not prevail; such defects may be due to abnormal conditions in the instruments of hearing, of mind, of innervation, or of speech; in a practical point of view, and in connection with the art of teaching the dumb, or the deaf and dumb, the study of such cases is of great importance.

From inquiries already made, it seems probable that there are nearly 1,000,000 deaf and dumb human beings on the surface of the globe; they are, however, very unequally distributed, some countries having a great, others a small proportion of this class of sufferers. It rarely happens that the proportion is great in salubrious regions, and it may be observed, that wherever deaf-dumbness is exceedingly common, other maladies and

defects of organisation may at the same time be found to prevail, in more than the usual ratio ; in illustration of this statement, we need only call to mind, that in some parts of Switzerland, where cretinism is met with on all sides, deaf-dumbness is unusually frequent.

The causes of congenital deafness seem to tell, in particular districts, in a manner not yet well explained. In the “*Journal de l’ Instruction des Sourds-muets*” of Bebian, speaking of the canton of Vaud, in Switzerland, it is remarked, that in 67 parishes there is not a single deaf-mute ; in the other 55 there are 152, which is about one in every hundred of the population. The great difference between these two groups of parishes, with regard to deaf-mutism, probably depends upon conditions peculiar to the locality, and such a difference is likely to be an increasing one, by virtue of the defects, which, not prevailing in one set of parishes, are likely in the other to be multiplied by hereditary descent ; and this danger may be regarded as great in valleys, where small numbers of people are locked in by surrounding mountains, and where the tendency to intermarriage is thus favoured, as it were, by the very figure of the earth ; in connection with which we must not lose sight of the fact

that such may have been in some measure the primary source of the evil alluded to ; the marriage of cousins, or other blood relations, being thought to favour, in a very remarkable manner, the arrival of a deaf and dumb progeny.

Even a cursory glance at truths of this nature may shew that there are certain conditions into which human beings may be thrown, or which fall, as it were, to their lot, tending to favour the occurrence of deaf-mutism ; and it is evidently of the utmost importance to determine, as nearly as may be, what such conditions are, that they may be the more carefully and readily avoided by all who are able and willing to avail themselves of the information which has been obtained respecting them.

In the study of cases of deaf-mutism, it is of the utmost importance to determine whether the dumbness be a consequence of congenital deafness, or whether it be the result of loss of hearing which has occurred at a very early period of life, the circumstances of climate, soil, and parentage having an especial bearing in connection with the former class of cases.

Mutism must not be confounded with aphonia : the power to produce sound and to employ articulate speech

are two very different things ; the former is possessed by the higher animals, as well as by man ; the latter, (with exceptions that need not be noticed,) by man alone ; so that mutism is, of necessity, peculiar to man ; but, in dogs, and other animals, aphonia is met with in connection with inflammatory affections of the throat, or other divisions of the air passages, as well as with paralysis of the muscles of the larynx. Cases of complete aphonia are rare, and in the cases of partial aphonia met with in the practice of human medicine the patient is commonly able to employ a whispering kind of speech ; and one convenient division of speech is, into the ordinary, or phonic, and the altered, or artificially produced aphonic speech.

The mutism associated with apoplexy, paralysis, hysteria, narcotism, intoxication, or that occurring as an antecedent, concomitant, or consequence of fevers, or exanthematous attacks, need scarcely be mentioned here ; and the fact that certain poisons are said to produce thickness of speech, or mutism, requires only a passing notice.

Galen remarks that opium put into the ear, for the purpose of relieving pain of this organ, has often caused mutism ; and Sauvages, the nosologist, tells us that in

the neighbourhood of Montpellier there was a certain gang of robbers, who compelled those who fell into their hands to drink wine mixed with the seeds of stramonium, and that this potion had the effect of preventing discovery, as it produced in those who had been compelled to swallow it a state of mutism which continued for a day or two. This story is at least interesting, whatever the facts may have been.

The inability to speak associated with idiocy, or the want of power, or will, to do so, which may prevail for months together, in patients suffering from melancholy or other form of mental aberration, the feigned mutism now and then met with, and the cases where the tongue has been injured, or where a part, or the whole of this organ is wanting, are worthy of mention in this place, as their due consideration may furnish suggestions bearing upon differential diagnosis.

Amongst the cases of mutism which have recently come under my observation, three classes may be noticed:—first, cases of mutism depending upon affections of the nervous centres, without aural disease; second, cases of mutism connected with diseased states of the ear; third, cases in which encephalic or aural disease did not exist, and where the state of mutism

depended solely on defect in the organs of speech, or the nerves supplying these organs, or upon some other cause the nature of which could not be completely unveiled.

In the generality of the cases of dumbness associated with congenital deafness, it has not been possible to determine with precision the nature of the anatomical conditions on which the want of hearing depended.

This is also to some extent true with regard to certain cases of acquired deafness, where the aural affection is, as it were, a sort of branch of a morbid state telling upon the nervous centres, as in some cases of deaf-mutism consequent on hydrocephalus, or attacks of epileptic or other convulsions, or on cerebral or cranial disease. In other instances, however, more especially in those where aural disease has followed on throat affection in very early life, where destruction of the membrana tympani, with loss of the ossicula, and probable injury of the labyrinth, have occurred, the anatomical alterations, which, in great measure, account for the loss of hearing, become, in part, the subject of physical diagnosis.

In these cases we have anatomical and physiological defects which, as it were, correspond, while, in most

of the other cases above alluded to we meet more or less with the same physiological defects, without being able to determine, by physical diagnosis or rational inquiry, what that state of the organisation may be which is associated with the want of function in question ; this remark applies, of course, to observation and inquiry capable of being made during the life of the patient ; for, viewed in connection with *post-mortem* discovery, it would not always be applicable.

It is known to all observers of deaf-mutism that the loss of hearing which occurs in connection with many cases of scarlet fever is one of the more common causes of this distressing malady ; this should be especially borne in mind in estimating the relative prevalence of deaf-dumbness in different towns, counties, countries, islands, or continents ; for visitations of scarlet fever may have been extremely severe in one district, while they may have altogether spared another, and thus a region not generally containing more than the average number of deaf-mutes, may, in certain periods, as a consequence of an epidemic, present more than its ordinary proportion of *acquired* deaf-dumbness, the excess of which will be more plainly seen when the proportion of cases of *congenital*

deafness to be met with in the same district is brought into comparative estimate ; for, in this way it may be found, that amongst the great number of cases of deaf-mutism which attract attention, a relatively large proportion will be met with amongst children who once enjoyed the faculty of hearing, but lost it as a consequence of disease ; and this, occurring at a sufficiently early period of life, is all that is required for the production of deaf-dumbness.

Amongst epidemics that often tell upon the ear so as to destroy audition, and thus prevent the acquisition of speech in the very young, or cause the loss of that little which has been acquired in patients somewhat older, scarlet fever does not stand alone—the other exanthemata, such as measles ; and fevers generally, but more especially typhus, may be mentioned ; in connection with which various affections of the nervous system might be named ; but along with the injury which such complaints often do to the hearing, we frequently have some serious disturbance of the functions of the nervous centres, which renders the deafness of relatively little importance.

It is no little that is required to enable a human being to display his peculiar privilege—that of speech ;

an ear to catch the articulations of others, an auditory nerve to transmit them, and a brain to perceive them, are, in the first place, employed. Impressions thus received must be preserved by the faculty of memory, the quality of which depends on the age and other conditions of the encephalon. When language thus heard and retained requires to be reproduced in imitative speech, an act of volition on the part of the brain is wanted, and nerves to carry the influences of this volition to the vocal, or laryngeal and oral portions of the respiratory apparatus, are next brought into play. The tongue, thus animated by its own special nerves, requires to be a strong, but at the same time soft, flexible, mobile, and untiring organ, and must be contained in a speech-case, or mouth, supporting it in a peculiar manner, and offering certain resisting parts and boundaries, with the aid of which, and against which, it may play. The comparatively yielding floor, the soft sides, and the hard roof of this cavity, with the shape and elevation of the gingival and dental arches, are elements of importance in the study of articulation.

The atmospheric apertures of the mouth, guarded by lids, valves, or sphincters, labial in front, glosso-

palatal behind, communicating with the pulmonary atmosphere within, and with the external air without, must be in normal condition to enable us to enjoy the full privileges of articulate and oral language. Hence we see that speech, so simple, and beautiful, and powerful, by which the poets and historians of Greece, with the peerless language of Helen, roused their countrymen at the Olympic games, by which Demosthenes ruled the Areopagus, and Cicero the bar of ancient Rome, by which Flechier and Massillon thrilled the cathedrals of France, and Chatham and Fox the senate-house of England, although apparently so easy, and, as if natural to man, is, when viewed physiologically, a very complicated act, requiring on the part of the human being that peculiar power, so significantly alluded to by Anacreon as the privilege of "voice-dividing men," while, for the display of this power, the harmonious combination of a series of curious movements, performed by equally curious mechanism, is at all times essentially necessary.

Amongst these complicated instruments of hearing, of thought, of memory, and of utterance, it is not surprising that one or more should now and then fail to be able to continue its former action, or that, the

original formation of the organ being defective, its normal function should never be attained to ; this statement will be illustrated more or less by the cases of deaf-dumbness and of mutism hereafter to be noticed.

It is worthy of mention that, in certain rare cases, we meet with alterations in speech after attacks of serious illness, where the defect of utterance is not associated with any defect of hearing. One instance of this kind, following an attack of scarlet fever, is hereafter mentioned, mainly with a view of shewing the importance of a cautious diagnosis in cases of defective speech or of mutism.

For reasons that are obvious, comparative pathology has hitherto thrown no important light upon deaf-mutism ; there is, however, good reason to think that some addition to our knowledge of the interesting subject of congenital deafness may be expected from this source.

If the mammalia in general were speaking animals, deaf-mutism might frequently be met with amongst them, and then the field of inquiry relating to it would be largely extended, mainly in connection with cases of congenital deafness ; less often, perhaps, from the occurrence of disease of the nervous centres affecting the auditory organ, or from maladies carried from the

mucous membrane, or the skin, to the structures of the ear. It would be interesting to know the relative frequency of congenital deafness in different classes of animals ; and further, to know whether the graminivorous, carnivorous, or omnivorous feeders most frequently display this peculiar defect.

These observations are in part suggested by the study of an interesting group of deaf cats, which have lately come under my notice. A neighbouring village has been to some extent peopled by them ; they are all the descendants of one mother, totally deaf, and of a somewhat peculiar appearance, being perfectly white, with not a dark hair upon her, and with a peculiarly pale blue iris—a sort of approach to albinism in the cat. It is worthy of remark that the whole of the progeny were not deaf ; but it was commonly noticed that those closely resembling the mother in appearance, or having the peculiarly light colour, wanting all pigment, as it were, had no hearing.

If, in connection with this subject, some united, widely spread, and general effort were made by those engaged in the observation of disease amongst men and the domesticated animals, in the different enlightened countries of the world, but more especially in Europe

and America, we might fairly hope to obtain more useful information respecting the nature and causes of congenital deafness in a dozen years, than has hitherto been accumulated from the earliest period of the history of medicine until the present day.

In the study of mutism, as it is observed in the human being, we must not lose sight of the conditions of the encephalon, or of mental phenomena, in an exclusive attention to the organs of voice and articulation; the state of the mind, and of memory, in particular, must be duly considered, and the effects occasionally produced by injuries of the head, and by abnormal conditions of the circulation, kept in view.

After recovery from as erious injury of the head, a man was supposed to be dumb; it was, however, accidentally discovered that he was a Welshman, and had entirely lost the power of speaking English (which was the language he commonly employed before the occurrence of the accident), but was able to speak the Cymric, or his mother tongue.

An Irishman was put under the influence of chloroform, while I removed a large encysted tumour from the right inguinal region; during the time that the influence of the vapour prevailed he spoke and shouted

in Irish, the language of his childhood, although not lately in the habit of employing the Celtic speech of his forefathers.

Both these seem to be remarkable illustrations of the lasting effect of the first acquired language, and of that which we may call the volatile character of other forms of speech more recently attained. These patients possessed two languages each; mutism, with regard to the last acquired language, occurred, while the power of speech in that first acquired was retained; the illustration, however, which is somewhat imperfect with regard to the latter case, is more complete in the former.

Viewing the human race as a whole, we cannot help seeing that, hitherto, the study of deaf-mutism has been commenced (not to say carried out) in but a comparatively small division of the human family; for it is only from the *more enlightened* Christian countries that we can obtain any really useful information respecting this interesting subject of scientific and philanthropic inquiry. Our valuable information is chiefly European and American; from Africa, Asia, or Polynesia, we have but little. We must, however, bear in mind, that Oriental tribes dwell amongst the

people of Europe in a comparatively isolated or separate state, so that the question arises, is deaf-dumbness alike prevalent with them, and does it seem to spring in an equal degree from the same causes that produce it amongst the Europeans, side by side with whom they are placed ?

A gentleman of the Hebrew community, alike remarkable for his urbanity, kindness, and learning, informs me that, although cousin marriages are very common amongst his people, cases of deaf-dumbness are very rare ; by his position in the priesthood, and the important duties connected with it, his attention has been directed to matters of this kind, and the question respecting mental defects as a result of cousin marriages has not escaped his observation. Such defects, he states, are of somewhat frequent occurrence. Out of this remark arises the question what are the proportions of cases—

Of mental defect,

Of deaf-dumbness, or

Of mental defect and deaf-dumbness together, amongst the issue of cousin marriages in the different Christian nations of Europe ? Are these proportions in any way remarkably different with the Hebrew

community in Europe; or are they different with the Hebrew community settled in Asia, Africa, or America?

The same gentleman, however, thinks that in the East cousin marriages have not been observed to be as frequently followed by a defective offspring as they are in Europe, and that the want of positive laws to forbid this kind of union amongst the Hebrew people tends to shew that any evils arising out of it had not pressed themselves upon the notice of the sagacious legislators of Israel. This observation, however, would equally apply to codes of modern Europe, where physiological science declares the evil, and suggests the remedy, but where moral science (in its legislative aspect) does not apply it; a fact of some interest, inasmuch as it shews that the former, viewed as a department of thought, is in advance of the latter, viewed as a source of action. The question of liberty in relation to such matters is not a theme for these pages.

The results of marriages amongst those more or less nearly related, which occur with the Gipsies, are scarcely to be learned from a people of such nomadic habits, and whose only science is fortune-telling.

The great and interesting question here suggested might thus be expressed:—Do peculiarities of race,

or of climate, or of both combined, tell upon the results of cousin marriages, as far as congenital deafness is concerned, so as to make the proportions of such cases vary with different races and countries?

There is little doubt that the progress of the physiological and moral sciences, aided by statistical inquiries, which are essential to the epitomising and practical application of valuable information in both, will gradually lift the veil from the secrets to which such questions are directed.

It is quite clear that inquiries analogous to those above suggested should not be lost sight of, as far as some of the vertebrata, but more especially the domesticated mammalia, are concerned.

The tribes above noticed as Oriental are rather, in the main, the descendants of certain Orientals, with little or no mixture with other races, while Europeans, generally, whether Celtic, Germanic, or Selavonic, may be regarded as of Oriental origin, but modified in their physiological aspect by climate, circumstances, and occupations, and especially by various crossings and mixtures of race; to which, in great measure, the symmetry and strength of the men, and the complexion and beauty of European women, may, perhaps, be

attributed ; but it should be borne in mind that cultivated nations, generally, have no fixed, lasting, and common standard, to aid them in the estimate of beauty ; that which is called beauty being, in a certain sense, not a real, but a relative thing, which varies with different countries, if not with different times.

Pure races are often remarkable for that which is called “ character ” in form and expression ; mixed races seem more frequently to want this. There is good reason for thinking that the Greeks, who may be supposed to be represented in the best products of the Athenian chisel, were a very mixed race, while the warriors of Nineveh, immortalised by long-buried sculpture, were, perhaps, men of less mingled stock ; the former are remarkable for beauty, while the latter strike us by “ character.”

If we could take a thousand cases of cousin marriages, and another thousand of the matrimonial union of couples not related by consanguinity — other circumstances being the same — and compare the results, with regard to the periods of birth, the number, and the physical and mental characteristics of the progeny, we might thus obtain data worthy of careful comparison, and altogether removed from the influence of popular

opinions or prejudices, for of these it is absolutely necessary to steer clear, in attempting the solution of questions like those alluded to above.

The opinion, very commonly received in Europe, that intermarriage favours the deterioration of the offspring, is opposed by some interesting facts which evidently tell in the opposite direction ; these relate partly to the human family, and partly to the domesticated and other mammalia.

Close family intermarriages are sanctioned by the laws and usages of the disciples of Mahomet ; and the Mahometan inhabitants of a particular district of India, who strictly abstain from all intermarriage with other people, have been regarded as amongst the finest groups of the human race. The *early* history of the Jewish people supplies many interesting facts, which do not favour the idea of deterioration of offspring by intermarriage.

In some cities, or parts of cities, and towns of modern Europe, and the neighbouring isles, where intermarriage is common, degeneracy or deterioration of offspring is not observed ; this is said to be true with regard to one division of the city of Rome, where the inhabitants pretend to be the descendants of that

brave race of men who first peopled the Seven Hills, defended the banks of the Tiber, and held the Tarpeian rock ; it is said to be particularly the case at Newhaven, near Leith, and in some other fishing towns and villages of Scotland.” “ In one of these places inquiry has been instituted by a gentleman residing in the neighbourhood, and he ascertained that one quarter of the marriages were between first cousins ; but that no prejudice existed against these connexions, and that no failure in the number or physical characters of the offspring had been noticed.”

“ There is a peculiar breed of cattle which is supposed to have existed in Northumberland for upwards of a thousand years, which maintains its characteristics unchanged, and is remarkable for vigour and beauty. The whole herd is kept within restricted limits as to number and space ; and when the well-known habits of these animals are considered, there can be no doubt that the closest breeding has been in continual operation.”

“ The Arabs, who, it is said, can trace their most valuable horses to the time of Mahomet, have continued to maintain the value of their studs, whilst they most carefully reject the smallest crossing.”

" Both the celebrated Childers and Eclipse were descended from a horse of remarkable strength, the offspring of parent and foal; and the descendants of these horses, which still maintain the highest estimation, afford numerous instances of very close breeding."—*Steinau.*

It is evident that this question requires to be studied anew, in all its phases, and with the strictest regard to the exclusion of the various sources of error (of which there are many) before a satisfactory balance of the truths which relate to it can be exhibited in the light of science.

Some of the preceding remarks might seem to show that people need not be so much afraid of cousin marriages as they are wont to be: so much for this part of the matter in connection with the probable occurrence of deaf-dumbness in the offspring: the issue or results of the intermarriage of the deaf and dumb (with one another), or of the marriage of a deaf and dumb husband with a hearing and speaking wife, or *vice versa*, have been especially attended to in America, and it has *there* been found, that even where both parents are deaf and dumb, deaf-mutism in the children is the exception, and not the rule, and that even the

occurrence of the exception is rare : such facts evidently require to be studied side by side with others observed in different races, climates, and circumstances.

In the study of cases of mutism and deaf-dumbness, it might at first sight appear more simple and natural to take cases of mutism first, next cases of congenital deafness, with consequent dumbness, and, last of all, cases of acquired deafness, and consequent dumbness. It has nevertheless appeared to me that the reverse of this arrangement is more likely to serve the purposes of scientific inquiry.

In the contemplation of some cases of acquired deafness, we have an opportunity of studying certain causes of the loss of hearing, the nature of which may be tolerably well appreciated ; and these causes are occasionally such as might possibly prevail in the production of congenital deafness, and of the dumbness associated with it.

The *position* of the other branch of inquiry, or that relating to mutism not associated with deafness, is of less importance. It appears, however, that a notice of mutism may well be placed side by side with observations on deaf-dumbness, were it only as a means of securing adequate pains-taking and refinement in dia-

gnosis, and of doing away with the erroneous notion that has prevailed with regard to the occurrence, or rather the non-occurrence, of cases of simple and uncomplicated mutism, or of dumbness without deafness, and without mental defect.

A distinguished writer on the “*Instruction of the Deaf and Dumb,*” has made the following remark in connexion with this subject:—

“Total dumbness seldom proceeds from any other cause than the want of hearing, or the want of intellect; at least, in no case have I ever met with it, except proceeding from the one or the other of these privations—so rarely is imperfection in the organs of speech the cause of it.”

It has appeared to me that if there existed in the British metropolis, or in some one of the great towns in the manufacturing and commercial districts of York and Lancaster, an institution for the reception and instruction of mute children, or those who, possessed of good hearing and intelligence, do not attain to the power of speaking within the ordinary length of time, or not at all, that such an establishment would soon number many inmates, would serve the cause of humanity, and aid the progress of science.

It need scarcely be said that speech is employed as a great instrument in the progress of human intelligence, and that mental development takes place slowly and imperfectly without its aid ; and hence, that it is important not to confound a mental condition, which is the *effect* of the want of speech, with one which may be supposed to be the *cause* of it.

Cases of mutism without deafness, and without any marked defect of intelligence, are seldom associated with any congenital and visible lesion of the organs of respiration, of voice, or of speech. In most cases of this kind, there seems to be some morbid condition telling upon the cerebral nerves, not to mention the possibility of a want of cerebral power with regard to the appreciation and production of language, without the ordinary phenomena of mental weakness or imbecility.

We meet, however, with remarkable cases of acquired dumbness, or of loss of the power of speech, from loss of the hard and soft palate, and of the neighbouring parts of the nose, in connexion with which it is most encouraging to know of the admirable effects which are often produced by prosthetic and dental surgery, of which a very remarkable illustration will hereafter be mentioned.

Congenital defects seen within the mouth, rarely

prevent the *acquisition* of speech ; generally, the *want* of parts is not great enough to lead to this serious evil : acquired and great defects, however, may cause a *total loss* of the power of articulation, however perfect this power may previously have been ; as in cases where the whole roof of the mouth, the soft palate, and interior of the nose, are carried away by syphilitic ulceration, depriving the tongue of some of the *points d'appui* which are essential to the purposes of articulation ; in connexion with which we may just remark, that a long-continued morbid and painful condition, which for a great space of time annihilates the articulating functions of the tongue, should be carefully watched, lest the complete and great loss, above alluded to, should be sustained in any case where a diminution of the evil, by timely and methodic efforts at articulation, might be within the range of possibility.

Acquired Deaf-Mutism.

February 24, 1854.—A. R., at. 3, a fine, healthy-looking, light-complexioned, and grey-eyed little girl, "had a slow fever, at Easter, 1853." With this she

suffered during three months, and became exceedingly thin. She heard well, and spoke well before this attack, but has been deaf and dumb ever since.

The acoustic nerve appears to have suffered, perhaps also the cerebrum.

In many cases of disease of the ear, such, for instance, as occur in connexion with scarlet fever, the loss of speech is plainly a consequence of the previous loss of hearing. In this case, however, there may be some cerebral lesion to account for the loss of speech, independently of the injury done to the internal ear, or to the intracranial parts connected with it.

Those parts of the auditory apparatus which lend themselves most completely to physical examination, do not betray any morbid condition; but it is nevertheless quite possible that morbid changes which have commenced in the Eustachian tube and tympanum, thence extending towards the labyrinth, may be amongst the sources of the patient's misfortune.

The parents of this little girl were recommended to place her in a suitable school, at the earliest convenient period.

In such cases, where it is not probable that hearing will ever be regained, the sooner we avail ourselves of

the other senses, for the purposes of instruction, the better will be the results.

The short but graphic account given of the mode of origin of the deaf-dumbness, in this case, suggested at once a very unfavourable prognosis. “A slow fever, of three months’ duration,” with great wasting of the body, followed by deaf-mutism, augurs anything but well with regard to the probability of future recovery.

Whether, in this case, the primary phenomena were gastric, or encephalic, whether, at any period of the progress of the case, these two groups of phenomena co-existed, or what influence an antiphlogistic, counter-irritant, or mercurial treatment might have had, are questions which suggest themselves in connexion with such a case, although it may now be too late to solve them.

One of the most interesting considerations, in connexion with such a case, relates to the question as to whether it is probable that morbid processes analogous to those which have taken place in this child, about the end of the second year of extra-uterine life, may not occasionally occur during the period of intra-uterine existence, the latter producing “congenital,” as the former produced “acquired,” deafness.

When the diseases of the nervous system, and of the serous and mucous membranes of the foetus, are better known, it may, and probably will, be found that morbid processes occurring in these parts are occasionally the forerunners of congenital deafness, as in after-life they now and then are of acquired deafness.

Congenital deafness, occurring in this way, might not be associated with any *remarkable* abnormal formation or morbid condition of the ear itself; and we know that in *many* cases of this kind such states have not been found, on post-mortem examination.

The circumstances often associated with the occurrence of congenital deafness, favour the idea that this defect depends on some abnormal condition, which, at first, has told more within the cranial cavity than within the petrous bone.

Take, for instance, the occurrence of deaf-dumbness as a result of the marriage of blood relations: this consanguinity, or conervosity (for blood is not all), must affect the constitution or economy of the new being as a whole; but its more visible or remarkable effects are often seen in the nervous system and organs of sense—mind, hearing, or both these, being frequently affected, vision suffering less often.

Meningitis. Acquired Deaf-Mutism.

September 1, 1854.—W. N., æt. 7 years, had “inflammation of the brain” when two months old, and on his recovery was found to be deaf.

During the last two years enlargement of the tonsils has prevailed, and any attack of cold produces unusual noise and difficulty in the respiration.

In the external meatus the appearances are normal, the deafness being apparently of cerebral origin in the main.

The left nostril is abnormally contracted.

Affections of the brain and its membranes, in children, sometimes with, sometimes without, hydrocephalus, are frequent forerunners of deafness and of deaf-mutism, when they occur in the very young; so that very early and prompt treatment, in such cases, is important, first to life, and next to the organs of sense, and to speech, in cases where life is preserved.

It should ever be borne in mind that the diagnosis of the state of the Eustachian tube and tympanic cavity is essential to the complete examination of many cases of deaf-mutism. Unfortunately, the requisite enquiry is always difficult in young subjects, and not practicable

in those of very tender age, who must generally wait a while before the catheterism of the Eustachian tubes can be satisfactorily accomplished.

In some of these cases, however, auscultation comes to our aid, practised during the act of swallowing, or while the patient blows forcibly, with the nose and mouth closed.

In the case just noticed, the air could be heard to enter the tympanum on both sides.

Acquired Deaf-Mutism, of doubtful mode of origin.

November 10, 1854.—Harriet J. D., æt. 8 years, “was born with good hearing.” Born in Liverpool, she went to America, with her parents, at the age of ten months.

“At twelve months old she had fever in America, and ever after seemed quite deaf.”

The external ear and meatus are on both sides in normal condition; the left membrana tympani is normal, the right concealed by cerumen.

In this case it is not easy to determine whether the deaf-mutism depended upon some congenital defect, or whether hearing may not have been lost at the time

when the child suffered from "fever," and hence speech never acquired.

As far as we can ascertain, the organ of hearing has not undergone any anatomical change; and although this observation alone may not prove much, it suffices to render the congenital defect a little more probable.

The information given by the parents respecting the condition of the child previous to the attack of fever, does not throw any real light on the subject of inquiry.

It is not known that any relative, near or distant, has suffered from deafness, from mutism, or from both.

Acquired Deafness, from Hydrocephalus. Consequent Deaf-dumbness.

December 6, 1854.—E. P., æt. 16 months, a fair-complexioned, blue-eyed little girl, was attacked by convulsions at the age of three months; at four months old symptoms of hydrocephalus came on; the head is now of enormous size, but "has not increased during the last six months;" the circumference of the widest part of the head is twenty-one inches.

The patient is completely deaf—a state which seems to have come on along with the hydrocephalus;

speech, in consequence, will not be acquired, unless the hearing should be regained, and of this occurrence there is very little probability.

The widening of the lower part of the skull, and the associated stretching and pressure, from which the acoustic nerves must suffer, in cases of hydrocephalus where the head is much enlarged, help to account for the insensibility to sound which in such cases is occasionally met with. The pressure of the fluid into the internal meatus—a physical condition which must here prevail—is also worthy of notice.

This is one of those cases of deaf-mutism most evidently depending on intra-cranial changes, the conditions of which could not of course be benefited by attending merely to the organ of hearing.

In this instance there was no particular reason for thinking that maxillary or dental irritation had told upon the production of the head affection. It is, however, quite obvious that the active treatment of such irritation might be of the greatest importance in any case where it prevailed—hearing, speech, intelligence, or even life, being threatened.

Deafness, blindness, or both, may occur as results of hydrocephalus ; deafness is by no means rare ; blind-

ness, however, is not so often met with ; while deafness and blindness, together, are seldom observed.

The lateral widening of the head, which is often noticed in cases of hydrocephalus, must tell upon the acoustic nerves ; while the antero-posterior elongation of the head, which would be more likely to affect the optic nerves, is more opposed by the mechanism and strength of the frontal and occipital parts of the skull—to say nothing of the structure of the nerves of vision—which are much more likely to resist the influences of stretching or of pressure, than is the soft material of the *portio mollis*.

We now and then meet with cases of blindness, occurring during the progress of hydrocephalus, where the *elongation* of the head is not more striking than the increase of its width. This occurred lately in the case of a little girl, four years of age, who came under my notice ; she was attacked by hydrocephalus, of which she died after six weeks' illness ; she lost her sight fourteen days before death, and never regained it : the pupils were widely dilated, but in other respects the aspect of the eyeballs was normal.

The next case of hydrocephalus, in which complete blindness occurred, without alteration in the other organs

of sense, or disturbance of the intelligence, belongs to the class of maladies above alluded to, and on this account its notice in this place may be permitted ; and with it may be connected a short notice of another case, of remarkable expansion of the upper part of the cranium, from hydrocephalus, without appreciable alteration of any of the organs of sense.

It need scarcely be said that all the remarkable alterations of intelligence, or of the external senses, which may occur in connexion with hydrocephalus, are not to be attributed solely to expansion, pressure, or stretching of the cranium, the brain, or cerebral nerves; inasmuch as other results of morbid action may tell very seriously upon the structure or function of these important parts.

Hydrocephalus. Blindness. Good state of the Hearing.

William W., æt. 19, is totally blind ; he states that he suffered from "water in the head" when seven years of age : the attack came on "suddenly," and commenced "with a pain in the left ear," which was followed by diarrhoea ; and this being arrested "by medicine," the severe head affection followed.

The patient was confined to his bed during fifteen weeks, but he became blind at the end of the twelfth week ; he alludes to the occurrence of the blindness by saying that one morning, at six o'clock, he distinctly saw the clock, and noticed the hour ; but that two hours later, or at eight o'clock, he could not see at all.

During the twelve months that preceded the head affection the patient suffered from epileptic fits, which occurred about once in three weeks, or a month ; these fits did not return after his fifteen weeks' illness.

The amaurosis is accompanied by a constant oscillation of the eyeballs ; the pupils are widely dilated, and commonly directed downwards.

The other senses have not been impaired, and the intelligence is good ; the head is long and narrow.

A little girl, a sister of the patient, born next, and about two years before him, died of hydrocephalus at the age of two years, after seven weeks' illness ; in this case it is stated that vision was lost on the second day before death. There is no hereditary association to be made out in connexion with the occurrence of these head affections.

The quantity of serous fluid which may exist within the cranium, at different periods of the intra-uterine

development of the brain, appears to be a matter worthy of attentive consideration in connexion with alterations of the cerebral nerves, and the associated organs of sense. This quantity may vary from an amount unworthy of especial notice, up to an accumulation, by which the head of the foetus is enormously expanded.

In one case of congenital hydrocephalus, which came under my observation, the womb of the mother was torn open, at the time of parturition, by the enormous head of the child: this occurrence was immediately followed by her death, before which I did not see her.

Some approach to the determination of the period of utero-gestation at which hydrocephalus in utero most frequently occurs, or begins, might possibly be made by the comparison of a long series of observations; and this even might throw some light on alterations of the auditory apparatus, occurring before birth.

Hydrocephalus. Great Expansion of the Skull, without apparent Loss of Hearing or Sight.

September 6, 1856.—Ann M., æt. 6 months, a blue-eyed and fair-complexioned child, born in Liverpool, of Irish parents, suffers from hydrocephalus of

three months' standing. Speaking of the origin of the malady, the mother says that one day the child was taken out by its nurse, apparently quite well, and soon after returned, hot and feverish, and that, in about a month after, she found that the head of the child was soft, and large, and that the cap could no longer be drawn over it as before.

The external ear is very small ; the orifice of the meatus is peculiarly placed, being lower, and more forward than in the normal state ; this change seems to be produced by the great expansion of the head, which has taken place more especially in the upward and backward direction.

The greatest circumference of the head is found to measure twenty inches ; in a child of the same age, and in good health, this measure is found to be seventeen inches. From ear to ear, along the course of the coronal suture, measures twelve in the enlarged, and nine inches in the normal head. From the top of the nose, along the course of the sagittal suture, and over the occiput, to the top of the neck, measures fifteen inches in the diseased, and twelve in the normal head.

As far as can be ascertained in this case, the functions of the higher organs of sense seem not hitherto to be destroyed ; this is evidently to be attributed, in

great measure, to the fact that the base of the skull is the part least affected by the expanding influence; and it is quite clear that if the cerebral nerves arose from the upper, instead of the under surface of the mass of the brain, that the stretching, or breaking, to which, in this locality, they would be subjected, would be likely, at a comparatively early period of the progress of such cases, to result in the abolition of one or more of the external senses. In such instances there must be a limit beyond which the cerebral ventricles could not be distended without injury to the cerebral nerves, more especially if any considerable dilatation of the lower part of the skull take place at the same time; at any such critical period the auditory nerve must commonly be the first to suffer. The division of the brain into two lateral halves tends, doubtless, to modify the effects here alluded to.

Acquired Deaf-Mutism. Illness after Vaccination.

Hydrocephalus.

January 19, 1855.—Annie S., æt. $2\frac{1}{2}$ years, a fair-complexioned and fine-looking child, with somewhat large and prominent forehead, had perfect health, and, from all accounts, perfect hearing, until the age of

four months ; she was now vaccinated ; the virus acted favourably, and “there was one good pock on the left arm,” but before this fell off she sickened, and was ill during two months, and soon after this period the head seemed to become larger than natural, and the patient was thought to suffer from hydrocephalus ; she was now less attentive to sounds than before, and the dullness of hearing gradually increased, until she had attained the age of twelve months, when it became quite evident that she did not hear at all.

At nine months old she was weaned, and did not walk until the age of two years.

The external ear has a perfectly normal aspect ; of the meatus externus the same may also be said ; but the deeper part of the meatus, and the membrana tympani, are both intensely red ; the intensity of this redness appears, however, to be increased by the cries and struggles of the child, the little patient making every possible resistance to the examination of her ears ; these remarks apply equally to both sides.

The account given by the mother of the morbid alterations of the system which occurred in this case soon after the vaccination is worthy of especial attention. A very useful volume might be written on the

various forms of disease which are now and then observed to follow the introduction of the vaccine virus into the human economy ; this remark is not intended to suggest the idea that vaccination is not desirable, but rather that its cautious practice is imperative.

Within the last seven years, several cases have come under my notice, in which serious disease affecting different parts of the body, but more especially the lymphatic system, and the joints, has followed closely upon vaccination, and in such manner that the relation of cause and effect could not be doubted of.

In some instances, joints, such as those of the fingers, of the knee, of the ankle, and of the lower jaw, have been destroyed, and in a few cases the patient has gradually sunk and died from the progress of the disease.

This belongs to a class of cases where the most pains-taking inquiry and cautious discrimination are barely sufficient to enable us to determine whether congenital or acquired deafness prevails ; the information given by parents may sometimes be useful, but it is too often capable of misleading, from the imperfect observation, or the well-cherished prejudices which may have preceded it.

Acquired Deaf-Dumbness. Hydrocephalus?

June 21, 1855.—Wm. L., æt. $2\frac{1}{2}$ years, a fair-complexioned, stout, broad-shouldered, and healthy-looking little boy, “began to speak before he was twelve months old,” and enjoyed the best of hearing. Ten weeks ago he was taken ill very suddenly; an attack of sickness and vomiting came on, followed by febrile excitement, with symptoms regarded, at the time, as those of hydrocephalus; after being kept in bed from a fortnight to three weeks by this attack, and much reduced, it was found that he was quite deaf, and shortly afterwards the gradual loss of speech was observed.

Opacity of the membrana tympani, and strongly-marked redness of the lining of the deeper part of the meatus, were observed on both sides.

The mode of origin of the illness, in this case, suggests rather the occurrence of cerebral than of aural disease. It appears not unlike what occasionally happens at an early period of the history of certain cases of amaurosis, depending upon some lesion or morbid condition of the nervous centres, such as tumour of the brain, meningitis, cerebral effusion, &c.

The redness seen at the bottom of the external meatus, and the opaque state of the membrana tympani on both sides, are remarkable ; and although the symptoms above noticed were such as we often find ushering in some serious head affection, it is all the while possible that inflammatory action, affecting the petrous bone generally, or the structures of the ear in particular, may have been the main source of the misfortunes of this little sufferer. Such inflammation might be the result of accidental injury, or it might occur spontaneously, or under the influences of the ordinary causes of otitis, more especially if the tubercular diathesis prevailed.

Acquired Deaf-Mutism, after Accidental Injury.

January 30, 1855.—H. A. B., æt. 2 years, a very fine, healthy-looking boy, had an apparent love of music at a very early period of life ; his mother states that “when nine months old, being then quite able to walk by himself, he would run from one room to another on hearing the sound of a musical instrument ; and this was but one of many proofs that hearing was not then wanting.”

At the age of ten months he bruised and burned the

back of his head, by falling upon a bar of the fire-grate ; after this accident he gradually lost flesh, became exceedingly emaciated and ill-looking, and could not walk ; the general health, after about a month, improved, but it was at least nine months before the power of locomotion was as good as before.

The head, viewed from behind, is particularly broad ; the aspect, however, can scarcely be called abnormal.

The external ear and auditory meatus have a normal aspect on both sides ; the membrana tympani cannot be clearly seen, and there is reason to suppose that it is wanting, or in abnormal condition. He does not hear the loudest sounds.

"At the age of four months he could say da, da," and in efforts of speech has never gone beyond this (?)

The information respecting this case is very imperfect ; however, that which relates to the injury of the occipital region, which was followed by loss of hearing, must be regarded as of great interest and importance ; and it seems very probable that some serious morbid action was at that time set up in the auditory apparatus, along with which, the nervous centres, and consequently the general health, and the power of locomotion, were damaged.

Acquired Deaf-Mutism. Loss of Hearing and Speech after
Injuries of the Head.

May 4, 1855.—J. T., æt. 26, a young man of short stature, light complexion, and blue eyes, with defective vision, from partial cataractous opacity, on both sides, but mainly on the left, is introduced as deaf and dumb, but it is found, on inquiry, that a vestige of the power of speech remains, and that a small degree of hearing also exists, not sufficient, however, to enable the patient to catch the articulation of the human voice, and thus avail himself of the requisite means for the development and perfection of speech.

On a small slate, which he carries in his pocket, he wrote the following notice of the origin of his deafness, *verbatim*, as below—

“I believe I lost my hearing after playing at a game of snow-balling, when five or six years old; for, being beaten so much with them about the head, and in the ears, I soon fell ill of this, and during my illness my hearing went off gradually, as well as during my recovery; a part of my speech went with it.”

The patient cannot hear anything like the tick of a watch, however closely the instrument may be applied to the ear.

The entrance of air to the tympanum by way of the Eustachian tube is heard on both sides, but very faintly. The external meatus has its ordinary dimensions, but it seems probable that important alterations have taken place in the more essential parts of the auditory apparatus ; and these changes having occurred at a very early period of life, it is easily understood that the subsequent growth and development of the ear and hearing have been materially interfered with by the morbid conditions which have long prevailed.

Before the time when this patient was injured by the snow-balls his speech was perfect, and the subsequent progress of the case is sufficient to show how easily language is lost when the hearing becomes very defective at so early a period of life.

Of the remains of audition he writes the following notice —

“ I can hear them shouting in my right ear, which makes me start up when it is too much for me, but I cannot make out what they say to me, as I have not had the practice of it. I can hear a little with my left ear, but not so much as with my right.”

It is interesting to notice the strange nasal, and, as it were, *ringing* noise, made by this patient when

he attempts to speak ; in the little which he is capable of uttering, the nose, if the sound only were attended to, would seem to play a greater part than the mouth ; one might imagine the whole, or nearly so, to be done between the throat and the nose : if the young man were met in a forest, his effort at speech would be more readily taken for the rude singing of a savage than for the language of a civilised man ; the intonation which he, like others, had formerly acquired, has been utterly lost, to be replaced by sounds which are equally disagreeable and indescribable.

In the treatment of such cases, it is evidently of the utmost importance to keep constantly in view the great fact, that the young patient has hitherto acquired the faculty of speech in but an imperfect manner, and to a very limited extent, and that articulation will be entirely lost, or very much altered and injured, in consequence of the loss of hearing, unless great efforts be made to keep up the habit of articulating in the accustomed way ; and this should be done without delay ; for, while early life lends itself, as it were, favourably, to this imitative act, it is well known that riper years smile less on any attempt at its acquisition.

Acquired Deaf-Dumbness, after Accidental Injury.

December 7, 1855.—J. J., æt. 2 years, a healthy-looking little boy, is deaf and dumb. It is stated by his father that, up to the age of eight months, he could hear well, and was even able, at this age, to articulate “a few little words,” (?) and, further, that he was a very strong little lad, and that he could stand very firmly, and was beginning to walk; but, unfortunately, at this period the child was nursed by a girl of fifteen, who, in company with another girl of about the same age, engaged in the amusement of throwing the infant from the arms of one into those of the other, when he fell to the ground between them.

On the day after this occurrence the child was heavy, sleepy, and impatient of being touched, and this dislike to being touched is said to have continued during six weeks after the accident; at this time he was in general sleepy, and would have slept all day in the cradle, if let alone, but was fretful if disturbed—all the while refusing to take food, as he had done before, and also taking less from his mother’s breast than he had been accustomed to do. At this period

the child lost flesh, became extremely pale, and for a short time his life was despaired of.

This accident, and subsequent illness, were followed by a state of great weakness, of four months' duration, during which time the patient had not that strength in his lower extremities which he had previously displayed; afterwards, however, he seemed completely to regain his general health.

Before the accident the little boy could say distinctly, "dada" and "mammy," but, in about four months after the injury, and when his general health was already re-established, it was found that these infant articulations were lost, and that all hearing was gone.

In the present state of the child there is no morbid appearance which ocular inspection enables us to discover.

It is not known that any relative of the patient is either deaf, dumb, or deaf and dumb.

The information respecting the accident above named is imperfect and unsatisfactory.

The nasal and buccal cavities, and surfaces, have their normal aspect. The external ear is normal in position, size, form, and colour, and the same may

be said of the external meatus—these remarks applying to both sides.

Cerumen is found in both the aural canals.

The membrana tympani on the left side has its normal appearance, on the right the membrane was not distinctly seen.

It is probable that, in this case, the loss of hearing depends upon intra-cranial changes, telling upon the auditory organ of the two sides.

If the external or middle ear, or both, had suffered from accidental injury, the case would probably have presented a different aspect; more or less, hearing might have remained, and there would probably have been considerable difference in the two sides.

In the absence of precise information, or of diagnosis, established at the time the child was suffering from the more immediate effects of the injury, it seems not unreasonable to suppose that cerebral effusion followed the accident, that in this way the function of the brain, and of some of the cerebral nerves, was disturbed, that the cerebrum afterwards recovered in great measure from the effects of the shock, but that the auditory nerves were left in a morbid state after sustaining an irreparable injury.

Inasmuch as parents are often very much disposed to *find* causes for congenital deafness (or rather to attempt to show that it was not congenital), it is obvious that the records of accidental injuries which have occurred to children in early life, and to which deaf-mutism is attributed, should be received with the requisite caution.

We cannot fail to notice that the illness which, in the case just reported, is attributed to the effects of accidental injury, was characterised by symptoms very much like those of hydrocephalus ; and in this respect the case may be compared with that of Ann M., æt. 6 months, in whom the head affection, followed by effusion, and rapid expansion of the skull, occurred in so sudden and unexpected a manner.

Some of the symptoms mentioned in the notice of this case of J. J. suggest the idea of rapidly occurring congestion, or cerebral effusion, without any consequent or visible alteration of the form of the head ; and it is *possible* that such a state might have occurred without accidental injury.

It has been previously remarked that the development of the ear is occasionally disturbed by the effects of accidental injury received in early life ; such injuries

are barely possible anterior to the period of parturition ; at this time they may occur in various ways, and more than one instance of morbid alteration in the aural region produced by obstetric instruments have come under my notice.

Falls are amongst the more common causes of injury of the head and ear, which damage the auditory organ, interfere with its development, or enfeeble or annihilate its function in the earlier periods of life ; in this way, hearing being destroyed before speech is attained to, the consequent deaf-dumbness is an inevitable state.

Injuries of this kind may affect the contents of the cranium, without telling in any remarkable manner upon the bony case itself, or the skull, and, as far as the ear is concerned, the temporal bone, may be very much damaged, without any remarkable, or appreciable lesion of the nervous matter of the brain, or of the cerebral nerves within.

In the case last noticed we have an illustration of the former occurrence, and in that reported below, for the sake of contrast, we find the latter as strongly pourtrayed.

Right Meatus wanting, after Fracture of the Skull. Polypus in the Left Meatus. Deafness. Remarkable state of Audition, as exercised through the altered part of the Skull.

Thomas S., æt. 24, with ruddy complexion, red hair, and healthy aspect, does not complain of extreme deafness, but has not good hearing on either side; the right ear was seriously damaged by a fall when the patient was six months old, and the meatus on the left side is filled by a polypus, which, from the patient's account, is a malady of thirteen years' standing, and has never been subjected to any medical treatment.

The history of the accident by which the right ear was injured, of the more immediate, and ulterior consequences, as well as the present state of the organ, is peculiarly interesting.

The patient says, "When I was about six months old, my elder sister was carrying me along a street in Manchester, when she unfortunately let me fall from her shoulder into a deep cellar at the side of the street; I fell upon my head, which was seriously injured. I was carried home, and not expected to recover; but I lingered for eighteen months, and

during all this time was constantly in bed, and too ill to be taken up, or carried about."

From the present aspect of the parts, as well as from the account of the patient, he appears to have suffered from a compound fracture of the right side of the skull, affecting mainly the squamous portion of the temporal bone, the hinder part of the zygomatic arch, and the bony meatus, the subsequent development of which parts has been curiously interfered with. On the right side the external ear is sunk into what we may call an excavation in the paries of the skull ; the ear is pale, somewhat smaller than that of the left side, and, in general aspect, very different, being flattened or imbedded in this abnormal depression of the aural region, while the opposite ear, red, and well developed, stands out from the side of the head, so that the right ear is commonly inside the hat, which slides over it when put on, while the left is outside it, and more or less bent down by it ; this state of things favours audition with the better, or less diseased ear, and gives protection to the more tender side of the head, where the widely spread, and white cicatrix, is found not only behind the ear, but also above and anterior to it.

The right meatus is wanting ; in other words, it terminates by a *cul de sac* at the part where the bony portion should begin ; beyond this, we feel nothing but a mass of solid bone, through which, however, the patient has some hearing. The left meatus is filled up to within about three lines of its outer orifice by a somewhat firm, red, and fleshy-looking polypus, through which the patient can also hear.

The study of the condition of the auditory nerves, with the aid of sounds conducted by the normal and abnormal parts of the skull, gives rise to considerations of some interest.

It appears that the auditory nerve of the right side is as good as that of the left side, although the ordinary hearing of the left side is better than that of the right, and, as before indicated, is what the patient mainly relies upon ; this will be easily understood by the following statement.

The vibrations of the tuning-fork, *applied* to the skull, are heard on both sides, but not equally well on both sides ; they are *much better* heard on the right, or deaf side, especially when the end of the handle of the fork is pressed behind the fold of the external ear (which is lifted up to make way for it),

and applied to the cicatrix at the bottom of the depression here met with.

We may be permitted to call this part, although on the deaf side, the focus of audition, for it really becomes such, when acoustic instruments are brought to its aid.

An ordinary cedar-wood stethoscope being applied to this part, the patient hears very well the words spoken at the opposite end of it—much better, indeed, than he does when the instrument is applied to the corresponding part of the other side of the head, or where the ordinary hearing is the best. That part of the skull which corresponds to the depression and cicatrix, seen externally, is probably harder than the neighbouring and normal structure, most likely deprived of diploe, and hence thinner; so that in it we have a better conductor of sound than we find in the healthy bone—a fact which helps to account for the phenomena noted above, and corresponds more or less with the results of the observations of Larrey and Savart, which have been previously mentioned; their observations, however, relate, mainly, to cases where portions of bone had been entirely removed.

In connection with the occurrence of accidental

injury, as well as with the results of cerebral haemorrhage, not to mention other morbid conditions of the brain, the question of cicatrisation of the nervous substance after the previous occurrence of a solution of continuity in the brain, or in any of the cerebral nerves, is one of equal interest and importance.

Although cicatrisation does occur in some rare cases of solution of continuity of the cerebral substance, and although it is probable that re-union of a divided, or partly divided cerebral nerve, may occasionally take place, it is very obvious, that in cases where the auditory nerve is divided by accident or disease, the extreme softness of its structure, helping, as it were, the occurrence of great alteration, would be unfavourable to any subsequent reparative process capable of re-uniting the soft and divided cord.

This question of cicatrisation of the nervous substance, along with that of the membranes protecting it, is so interesting, that the following case, which relates to it, and which recently came under my notice, may be shortly stated.

Mrs. C., æt. 69, died of apoplexy, on the 29th August, 1856; this was the third attack of the kind;

the first occurred three years ago, the second, one year ago.

On *post-mortem* examination, the vertebral and basilar arteries, and their branches, were found to contain a great quantity of earthy deposit; while the branches of the internal carotids scarcely displayed any alteration of this kind. The left lateral ventricle was filled with blood, which had passed into other parts communicating with this cavity; a firm clot rested upon the calamus scriptorius and roots of the auditory nerves. The right ventricle did not contain any blood, but, when laid open at its outer and back part, a remarkable cicatrix was seen, marked by considerable elevation above the neighbouring surface; the structure of this cicatrix was much firmer than that of any other part of the brain, while its peculiarly golden yellow colour attracted particular attention; on the exterior of the cerebral surface, at the corresponding part, there was a marked puckering of brain, and pia mater, as if both had been drawn towards the cavity of the ventricle by the progress of a reparative act, which, there is reason to believe, had followed one of the previous apoplectic attacks.

Here we must bear in mind that the primary morbid

condition which has to be viewed in connection with the apoplexy was the so called “ossification” of some of the cerebral arteries—whence the bursting, and the pouring out of blood, upon an otherwise sound nervous mass; so that we may easily imagine an effort of nature, made with a view to reparation of the damaged nervous substance, in a case where the cerebral haemorrhage had not been sufficient at once to destroy life.

Serous effusion, without haemorrhage, might possibly, although not probably, give rise to breaking of the cerebral mass, and, in such case, absorption taking place, clots would not be left behind,—some trace of which, after any great effusion of blood, we might expect to find.

The healthy state of every division of the ear, as observed in this case, attracted particular attention. The roof of the tympanum being opened, the distal side of the membrana tympani, the promontory, fenes-træ, ossicula, and corda tympani nerve, are all well seen.

We rarely meet with the organ of hearing in so healthy a state at the age of sixty-nine; this normal condition, however, is very interesting, and certain

points belonging to it throw light upon matters of importance in acoustic surgery.

The orifice of the Eustachian tube, the calibre of the bony part of this tube, and its direction, viewed in connection with the position and form of the membrana tympani, are especially worthy of notice.

A small probe passed through the tube, and across the tympanum, does not go and strike against the membrana tympani, but passes inside it, and nearly parallel with the plane of the bony ring into which the membrane of the drum is fitted; we might say parallel to the membrane itself, if this were evenly stretched within the bony structure that bounds it. A stream of atmospheric air, having the same direction, and entering the tympanum from the throat, could not, therefore, impinge directly upon the membrana tympani; it must strike the wall of the tympanum opposite to the orifice of the Eustachian tube, and then pass back by the same route, if not opposed in its return; if, however, this return of the air to the throat be sufficiently opposed, and the inflation of the drum be continued, movement and distension of the membrana tympani will take place, provided this membrane be in its normal condition, and not perforated

by crack or aperture—which would let out the air—or thickened, or otherwise altered by disease, so as to prevent its bending or yielding under the influence of the atmospheric pressure.

All we require for the movement and distension of the membrana tympani in the normal state is a sufficient inflation of the drum, with the requisite opposition to the return of the air by the way in which it entered.

It is easily understood that when air is blown into the tympanum, through the Eustachian catheter, it may return, either by way of the tube of the instrument, or between it and the sides of the Eustachian passage, or by both these routes; and this regression of the air is, in most cases, sufficient to interfere with, or prevent the distension of the membrana tympani.

In some cases, however, which have come under my notice, the difficulty in question has been overcome, and, with the aid of the Eustachian catheter and an elastic bottle fitted to it, the membrana tympani has been suddenly altered in form, driven towards the meatus, and visibly put on the stretch. Instances in which the patient could move this membrane, or put it on the stretch, by forced expiration during the

closed state of the nose and mouth, have not come under my notice.

It is evident that if the middle of the membrane of the drum were opposite to the tympanic orifice of the Eustachian tube, that a stream of air forcibly driven through the tube, and against the middle of the membrane, would stretch it, and act upon it in a manner which is not possible in the normal state of parts as observed in the human ear.

The relative position of the plane of the bony boundary of the membrana tympani, and of the axis of the bony part of the Eustachian tube—in other words, their parallelism, or inclination to one another (when not parallel)—may vary in different cases, so as to favour the distending effect of the air more in one case than in another. In one instance, the membrana tympani was carefully observed, with the aid of a good speculum and good light, while air was sent through the Eustachian catheter; a sudden distension of the membrane took place, which reminded one of the effects of the sudden inflation of a thin and delicate urinary bladder, where the muscular fibres all at once become visible when sufficiently separated by the pressure of the air, for lines in this membrana tympani

were distinctly seen as its texture was put on the stretch.

It is worthy of notice that the whole of the membrane is not equally distended in such cases ; it is the lower part which yields most completely to the air behind it, the upper part of the membrane being supported by the malleus, and this propped by the incus, which, in its turn, rests against the border of the mastoid cells.

It has been stated by one distinguished writer on aural surgery that distension of the *membrana tympani* cannot be produced by inflation of the drum ; the truth is, that in many cases—perhaps in most—it cannot, but in some it can ; and, what is more, it is so apparent, that the practitioner is at once alarmed for the safety of the structure, and stops the inflation which his assistant was practising, while he watched the changes that took place.

The effect produced upon the *membrana tympani* by inflation of the drum may vary in different cases, in accordance with variations in the size of the bony part of the Eustachian tube, whether these belong to the normal condition, or be the products of morbid action.

The small calibre of the osseous division of the Eustachian passage should never be lost sight of; a small probe fills it; but even the No. 1 urethral catheter, is, in many cases, too large for admission. The tympanic extremity, or opening of the tube, in the preparations before me, might, in size, be compared to the aperture of the human pupil, in its extreme contraction, at the noon of a bright summer's day; but this *orifice* is wider than is the bony part of the tube at a little distance from it.

The surgical anatomy of the membrana tympani should be studied in the fresh state. Two beautiful specimens of this membrane are now lying before me, dry and diaphanous; to each the malleus is attached, and to this the incus. When viewed in the fresh state, the malleus was seen to act in an especial manner upon the central part of the membrane, leaving a somewhat broad exterior ring of it unlifted, or unmoved, when the handle of the hammer was employed as a lever, by slightly pressing the body of the incus, so as to tilt up the point of the manubrium, attached to the membrana tympani, and thus lift the most moveable part of this membrane with it. A distinct line was visible in the fresh membrane, bounding this

small central part, which more especially yields to the action of the malleus, and is seen constantly to yield in the same way to like amounts of force; but, in the dried preparation, there is scarcely any trace of this line to be seen.

It is easily understood that this more especially flexible part of the membrane will be much affected in those cases where thickening and opacity of this structure occur, so much so, perhaps, that the malleus, under the influence of muscular action, may no longer be able to stir it, while the vibration of the membrane, when struck by the pulses of sound, will not be less interfered with; the deafness so commonly associated with the morbid changes just noticed, is, in some degree, explained by these considerations; and that found along with the vascular congestion of the membrana tympani, or with the state approaching that of pannus of the conjunctiva, lends itself at once to the same illustration.

From the two sides of the stapes very delicate folds of mucous membrane pass to the neighbouring bony surfaces, of which that of the promontory is one; now and then, delicate loose bands of membrane are seen within the bony hollow where the stapes is placed,

and which may sometimes be raised and rendered more distinct with the aid of the blow-pipe.

It is easily understood that thickening, or other morbid alterations of these mucous folds, may readily interfere with the actions of the stapes, and hence with those of the membrane of the oval opening, so as to produce an extreme degree of deafness, or to increase that which has previously arisen from affection of the membrana tympani, or some other cause. The depression, or excavation in the bone, into which the stapes is sunk, so as to rest against the oval opening at the bottom of it, gives a peculiar protection to this very delicate bone, and helps to account for the fact of its remaining so often *in situ* when the other ossicles are lost ; this protection, from position, and from the surrounding bony eminences, is aided by the fastening of the stapes to the membrane of the oval opening, as well as by the mucous folds above mentioned, and the connection of the stapedius muscle.

Acquired Deaf-Dumbness.

September 27, 1856.—Rowland B., æt. 6 years,
a fair-complexioned, healthy-looking boy, is deaf and

dumb. At the age of twelve months, he began to speak—having perfect hearing at this time, and, by the time he had attained the age of eighteen months, his fond mother thought that “he talked very well.”

At the age of eighteen months he was attacked by fits, and, during twenty-four hours, “was out of one into another,” with very short intervals: this was the first and only attack of the kind he ever had. After these fits the expression of the countenance was much altered; the little boy looked heavy and dull, and about three months elapsed before he seemed to regain his accustomed vigour; and it was about this time when his mother first discovered the deafness, which has ever since prevailed. During the illness, the weakness and sick state were supposed to account for his not speaking, so that silence then prevailing did not attract any particular attention at the time.

In cases of this kind we too often meet with a total absence of all sensibility to sound: in this instance, a watchman’s rattle being sprung near to the ear of the patient, but behind him, at once causes him to turn round, and look whence the disturbing influence comes; so that a faint trace of audition yet remains: he is

not, however, capable, as it would seem, of being affected by any ordinary tone of the human voice.

The history of this case suggests the idea that great attention should be paid to the condition of such patients after the more urgent symptoms belonging to the convulsive attacks have passed away ; therapeutic agents, such as mercury, iodine, diuretics, &c, are not unworthy of attention, in connection with the probable effect which they might have on the remains of cerebral effusion, or associated morbid conditions.

Congenital Deaf-Dumbness. Syphilis.

October 3, 1853.—R. J., æt. 3 years, a healthy and fine-looking, intelligent, and resolute little boy, has been deaf and dumb from his birth, six weeks before which his mother had syphilis ; and of this malady the child presented symptoms at fourteen days old, eleven days previous to which his mother suffered from a cracked and sore state of the right nipple.

The syphilitic eruption shewed itself first on the soles of the feet, whence it mounted to the ankles, and the scrotal and anal region in two or three days

after, became affected ; from these eruptions the child recovered in about six weeks.

At the age of about three months otorrhœa commenced in the right ear ; this continued about fourteen days, and then ceased, but from time to time returned during the ensuing eighteen months, after which it disappeared entirely. The left ear never suffered from otorrhœa.

There is no peculiarity in the aspect of the head, face, mouth, nasal cavities, or external ear. The meatus, on both sides, is somewhat small, and charged with cerumen.

His mother always speaks to him as to any other child, and he appears nearly always to understand her, by watching her gestures, and her mouth, as she believes, and the little boy himself is very active and expressive in his gesticulations.

“ Baba ” and “ mamma ” are the only articulations that he has attained to.

Syphilis might be supposed capable of injuring the auditory organ either before or after birth ; there is no positive proof that such injury took place in this case ; but the possibility of the occurrence is a consideration of great interest, even were it viewed only

in connection with the employment of mercurial or other treatment.

1856.—The above observations were made now three years ago; during this time the mother of the little boy has brought forth a female child, also afflicted with congenital deafness, but without anything abnormal in the aspect of the auditory organs of either side.

Mrs. J., the mother of these children, states, that about forty years ago, a male cousin of her father had two children, a boy and a girl, who were deaf and dumb.

Might a family tendency to deaf-dumbness be helped by the prevalence of syphilis in the pregnant mother, and might such influence tell more or less at different periods of utero-gestation?

Congenital Deaf-Dumbness.

J. H., æt. $3\frac{1}{2}$, a fair-complexioned, blue-eyed, and very intelligent-looking boy, is deaf and dumb; in connection with which there seems to be no hereditary association to be noticed.

The patient was vaccinated in the left arm, at six

months old ; this "took well," but one consequence of it was, irritation of the lymphatic glands in the left side of the neck, where a small abscess formed ; there is not, however, any valid reason for supposing that the ear suffered at this time.

The organ of hearing has its normal aspect on both sides.

Congenital Deaf-Dumbness. Scrofula.

Alice S., æt. 14, deaf and dumb from her birth, has an intelligent and expressive countenance, with brown hair, and dark brown eyes. The left membrana tympani is opaque, and of a dull white colour, saving at the central part, which has a little of the natural glistening appearance. The right tympanal membrane is in like condition, but the right meatus is a little narrowed by thickening of its lining membrane, which is of a red colour, and otorrhœa from this canal prevails.

The patient is an inmate of a Deaf and Dumb Institution, where she has been during the last five years ; her aspect is somewhat scrofulous ; there is a slight opacity in the central part of the left cornea,

of long standing ; and diseased tarsal margins now require attention.

In such cases, the possible abnormal development of the deeper parts of the organ of hearing, as well as the possible occurrence of tubercular disease, affecting the auditory apparatus, or neighbouring parts, *before birth*, are not unworthy of consideration. Amongst the morbid conditions capable of injuring the auditory organ before birth, after birth, or both, scrofula, or the tubercular diathesis, claims a great share of attention.

Congenital Deaf-Dumbness. Deafness in the Family.

February 22, 1854.—Ezra R., æt. 2 years, has “always been thought to be deaf;” he is a healthy-looking boy, and walked at twelve months old. It has been observed that noise does not awake him out of his sleep, and when a bell is rung near to his ear, he shews no sign of audition.

The mother says, “I have several sisters who are deaf; they are supposed to have gone deaf from cold caught in working in a factory; and my father is deaf, too; but he became deaf after falling from a building.”

The father, mother, and brother of the patient have all perfect hearing.

In this case there is nothing abnormal to be observed in the more external or visible parts of the auditory apparatus.

The tendency to aural disease in the maternal aunts of the patient is worthy of especial notice; it is not improbable that they suffer from affections of the tympanum, or Eustachian tube, or from both these sources of deafness at the same time.

Where congenital deaf-dumbness is met with in families, it often happens that we meet with cases of acquired deafness in different generations; the father or mother, brother or sister, cousin, uncle or aunt of a deaf and dumb child, may be found to suffer from deafness, and it is worthy of especial notice, that in such cases, the loss of hearing is often said to have come on without any known cause, and the external meatus, tympanum, and Eustachian tube, may be explored without our finding any anatomical alteration sufficient to account for the diminished audition.

It is not improbable that the auditory nerve in some of these cases is defective, that its powers fail

at a comparatively early period of life, and hence a sort of senile deafness occurs to the patient before he has attained even to the period of middle age. Such deafness may come on with or without inflammatory action, but there is reason to think that in many instances it has really been preceded by inflammatory affections of the tympanum, perhaps little felt, and altogether neglected by the patient, but nevertheless sufficient to injure the organ of hearing in both its accessory and essential parts, although traces of its effects may not be observed with the aid either of the speculum or the otoscope.

Congenital Deaf-Dumbness.

February 25, 1854.—Eliza H., æt. 5 years, is deaf and dumb; the auditory organs have their normal appearance, and in the family of the patient other cases of deaf-mutism do not seem to have occurred. There is every reason to regard the affection as congenital.

The patient is a healthy-looking, fair-haired little girl, of very intelligent aspect.

Congenital Deaf-Dumbness.

June 16, 1854.—M. L., æt. $6\frac{1}{2}$, a fair-complexioned, blue-eyed, and intelligent-looking little girl, has been deaf from her birth, and also dumb, with the exception of being able to utter a few words, such as “A, B, C, D; Mother; Gip; Harry; Beppey,” &c. These articulations appear to be the result of watching the lips of others, without hearing their language.

The external ear is very small; not larger than the ear of her little sister, who is only eleven months old. The meatus is very small on both sides, but smallest on the right, and its aperture is peculiarly circular; the membrana tympani has the normal appearance on both sides.

The vision is peculiarly good.

Other members of the family have not suffered from any aural affection.

Congenital Deaf-Dumbness.

September 26, 1854.—W. R., æt. 2 years, is deaf and dumb: the external ear, the meatus, and membrana tympani have their normal aspect on both sides.

The loud bell of an alarm is not heard, and the patient has never spoken.

No hereditary association can be discovered.

When the mother of the patient was about six months advanced in her pregnancy, she "saw a deaf and dumb man, and was very much startled at the sight of him."

In complexion and general aspect the boy resembles his father—having dark eyes and hair.

It never occurred to the mother that the child was deaf, until the age of about twelve months, when it was found that he made no attempt to speak.

A brother of the patient, now five months old, is believed to be free from all complaint of this kind.

The "sight" of the deaf and dumb man, by which the mother of the patient was so much impressed, belongs to a class of supposed causes of deaf-dumbness often alluded to by the populace; to settle the question as to their value would require the accumulation of a great number of well-observed and accurately compared and recorded facts. That such "causes" of deaf-dumbness are, in the main, imaginary, there seems to be very little doubt; the facts hitherto collected and studied tend to shew this.

August 29, 1856.—The patient is now a fine healthy boy, but a deaf-mute, and without any trace of audition.

It is worthy of notice that the mother now makes the communication that the man alluded to above was “not a deaf and dumb man,” but a man able both to hear and speak.

This fact is mentioned as a sample of the kind of information too often given, or offered, with regard to matters of this kind. Watch carefully, and it will often be found that the story, or antecedents of the case, will not be told three times in the same manner.

Congenital Deaf-Dumbness.

August 29, 1856.—Joseph L., *aet.* 2 years and 4 months, a deaf-mute, is the brother of the last-mentioned patient, and very much resembles what his elder brother was two years ago.

In this case the evidence of deafness was not satisfactory until the child was about twelve months old ; although there is not at present the slightest trace of hearing to be discovered.

The father of these two deaf and dumb boys is twenty-seven years of age, the mother is twenty-five; both are perfectly healthy, and were married five years ago.

It is not known that there is any deafness, or deaf-dumbness, amongst the relatives of either parent.

There is nothing abnormal to be seen in the aspect of the organs of hearing.

The difficulty which parents find in ascertaining the state of hearing in their children when very young is illustrated by the allusion to this little boy in the notice of the case of his brother, last given; this patient, when five months old, was "believed to be free from all complaint;" at this period he did not come under my notice.

Congenital Deaf-Dumbness.

August 29, 1856—J. G., æt. 4½, a fine, strong boy, with light complexion and blue eyes, is deaf and dumb: there is nothing abnormal in the aspect of the organ of hearing, but even the slightest trace of audition was never perceived.

It is not known that there is any deaf, or deaf and dumb person, amongst the relatives of either parent; the ages of the parents, and their time of marriage, correspond, as nearly as may be, to those of the parents of the two deaf and dumb brothers last mentioned.

The three deaf-mutes last noticed are all natives of Preston.

Congenital Deaf-Dumbness.

December 20, 1854.—Eliza Maria H., æt. 7 years, is deaf and dumb: the external ear, meatus, and membrana tympani, as well as the nose, and parts seen within the cavity of the mouth, have a normal aspect.

The patient utters the sounds “ba, ba,” and “wa, wa,” but seems incapable of producing any other; the “wa, wa,” is uttered when she points with her finger to the right ear, giving the parents to understand (as they believe) that she has a noise in that ear.

The deafness is not complete, as any very shrill or loud sound at once attracts her attention; she

seems, however, completely deaf to all ordinary tones of the human voice.

The affection cannot be traced to anything hereditary ; the only thing hitherto looked upon by the parents in the light of a possible cause is a sea voyage which the mother took, from Belfast to Liverpool, at a time when she was four months advanced in pregnancy ; she suffered very much from sea-sickness, and “*felt ill*” for some time after arriving in Liverpool, distressing herself much on leaving her native country to settle in England ; her subsequent confinement, however, occurred at the right time, when the patient was born in all respects a healthy-looking infant.

At present the child is in perfect general health, with a fair skin and clear blue eye.

It is well known to medical men that mothers often seek to account for morbid conditions in their offspring, by calling to mind untoward circumstances which happened to themselves during the period of *utero-gestation*—a proceeding in which the play of imagination is often greater than the effort of memory.

If congenital deafness were always the result of a morbid condition of the acoustic nerve, the greater

frequency of disease of this nerve, compared with that of the other cerebral nerves, would be very remarkable.

There is some reason for thinking that disease of the acoustic nerve, if not always, is very frequently the cause of congenital deafness.

Want of development of certain hard parts of the internal ear may be the result of *previous want* of development in corresponding parts of the membranous labyrinth, and nerve of hearing; hence it would follow that, in such cases, the true cause of deafness is defect in the auditory nerve.

Abnormal conditions, in which excess of development of this nerve is met with, are little known.

Does the soft, and easily broken texture of the auditory nerve, help us to account for any of its defects, injuries, or diseases?

The internal and external ear are separately developed in the foetus, so that the arrest of development, or its abnormal progress, in the one part, does not of necessity damage the integrity of the other.

In by far the greater number of cases of congenital deafness, the external ear is found to be in normal condition ; this is also true of the *membrana tympani*,

perhaps of the tympanic cavity generally ; but it would seem to be less often true with regard to the internal ear ; where, as in other parts of the animal economy, complexity of mechanism might be expected to lead to frequency of derangement.

Congenital Deaf-Dumbness.

June 20, 1855.—J. H., æt. 4, was first observed to be deaf at the age of two and a half years, and is now regarded as deaf and dumb, although “he can say ‘Baba,’ ‘Mamma,’ and two or three other little words of this kind ; but anything else that he attempts to utter is unintelligible.”

The external ear is normal, the meatus deep, and carried much forward, and the membrana tympani glistening and bright, on both sides.

No hereditary association can be traced ; the little patient has a clear, bright, and blue eye, with all the characteristics of excellent intelligence.

Congenital Deaf-Dumbness. Intelligence and instinctive Gesture.

Remarks on Death from Diseases of the Respiratory Organs.

A. B., æt. 7 years, a fine, intelligent boy, with dark brown eyes, and corresponding complexion, is deaf and dumb, "and very passionate." The deafness appears to have been congenital; and on examination of the ear, nose, palate, and throat, we do not find the slightest trace of morbid appearance.

This little boy is the eighth child of a family of eleven, and the ninth, or next to him, also a boy, and deaf and dumb, died of croup, at the age of two years.

The father and mother of these children are both natives of Sefton; at the time of their marriage the husband was twenty, the wife eighteen years of age; the former is of fair complexion, with blue eyes, the mother has dark eyes, and very dark hair; so that the little patient whose case is here recorded resembles his mother in complexion and general aspect, while the other deaf and dumb little boy had the complexion of the father.

A short time before the occurrence of pregnancy, in the cases of both these children, the mother suffered from venereal complaint, imparted to her by her hus-

band. This would seem to have been gonorrhœa ; both husband and wife suffered from the first attack upwards of three months, so that the pregnancy of that time was somewhat advanced before the disease alluded to was recovered from. From the second attack the recovery was more easy ; this attack was of not more than five or six weeks' duration.

These deaf and dumb children suffered from otorrhœa ; the muco-purulent discharge began to flow from the external meatus on both sides, in the case of the first child at one month old ; this discharge continued for two or three weeks, and then disappeared, with little treatment beyond that of carefully washing the ear. The other deaf and dumb child was affected at the same period of life, and very much in the same way.

This case affords an interesting opportunity of observing the modes of communication, instinctively adopted, as it were, for or by the deaf and dumb, and of noting the characteristics of intelligence with which those efforts may be associated.

This little patient "is a very good errand boy," very simple signs being sufficient to shew him what is wanted ; if a sugar basin be presented, and along

with it a piece of money, he starts off to the grocer's to fetch the sugar required, and readily appreciates other signs which, at first sight, might not appear so simple. He is also very adroit in the employment of signs himself; if he wishes to make it known that an occurrence took place two or three days ago, he shews that it happened two or three nights ago; this is done by holding up two or three fingers, as the case may be, to number the nights, and then resting his head on the palm of the hand, in the attitude of sleep, for the purpose of showing that so many sleeps, or nights, have passed since the time in question.

This apparently instinctive method of counting the nights somewhat resembles the practice adopted by various tribes of the human family in their computation of time, and it is worthy of mention that it was the plan adopted by some of the people of Kamtschatka, in communicating with visitors whose language they did not understand, at the time of a recent expedition to the Arctic Seas.

Death from croup is not uncommon amongst deaf and dumb children; in one case, which lately came under my notice, the little patient was a boy, six years of age, in whom the larynx appeared abnormally

small ; its narrow tube was completely filled by false membrane, through which respiration could not, of course, take place.

It is easily understood that the development of the vocal organs in the deaf and dumb must be somewhat modified by the state of comparative inactivity to which they are subjected ; a larynx little employed in the production of voice is likely to be of smaller size, or less developed, than the normal organ in its most active condition ; hence the greater probability of a fatal termination in cases of croup, where the small tube of the larynx is very soon filled by the morbid products of the inflamed parts within it.

It is worthy of consideration whether such a state of the laryngeal division of the respiratory apparatus tells upon the condition of the thoracic viscera, but more especially upon the lungs, fatal diseases of which are peculiarly frequent amongst the deaf and dumb ; this fact, however, should not be noticed without coupling it with the remark, that the scrofulous diathesis may have told originally upon the production of the deaf-dumbness, and subsequently upon that of the fatal, thoracic, or pulmonary complaint.

Congenital Deaf-Dumbness. Otorrhœa.

October 11, 1854.—Harry M., æt. 22 months, has otorrhœa on both sides, which was first observed at the age of six months; independently of this affection he appears to be deaf and dumb; but frequently, from his mother's account, making efforts to speak, by imitating the movements of the lips in those he is most accustomed to observe.

No hereditary association can be discovered on the side of either parent; the father and mother, as well as their immediate relatives, are free from aural disease.

There is nothing abnormal in the more external parts of the auditory apparatus capable of being brought into view, saving the otorrhœa above mentioned.

October 31.—The otorrhœa has been completely cured by the instillation of drops containing a small quantity of nitrate of silver, so that the deaf-dumbness is now observed without any complications.

In this case there is no good reason for supposing that the hearing was destroyed by the affection of which the otorrhœa was a symptom; on the other hand, there is little doubt that the misfortune of the

sufferer is dependent on abnormal conditions which date from the period of intra-uterine existence.

We must not underrate the importance of an attack of otorrhœa occurring at a very early period of life ; for if, in such a case, the lining membrane of the middle ear, generally, were affected, the membranes of the fenestræ, as well as the membrana tympani, might suffer, so as to lead to disease of the labyrinth, and consequent destruction of the function of the auditory organ. Further remark is not required to suggest the importance of early treatment in cases of this description, which supposes, of course, the necessity of an early and well established diagnosis.

In these two last noticed cases we have illustrations of two different aptitudes, if so they may be called, of the deaf and dumb ; in the first case, the language of signs is very rapidly acquired ; in the second, the act of reading the lips of those who speak is as easily attained to.

Congenital Deaf-Dumbness. Frequent difference in the intensity
of Congenital and Acquired Deafness.

In many cases of congenital deafness the want of hearing is complete ; in other words, there is a total

insensibility to sound. If two deaf and dumb children be examined, the one suffering from congenital, the other from acquired deafness, the cophosis in the former case is often complete, in the latter it is often partial. It may, however, be complete, or partial, in either.

John B., æt. $2\frac{1}{2}$ years, a healthy-looking, blue-eyed little boy, is deaf and dumb. In this case, pistols fired behind the head of the child are not heard, the experiment having been made by the father before the patient was introduced to my notice.

Such a degree of deafness is evidently associated with defect in the parts essential to hearing, such as the labyrinth and acoustic nerve, and would rarely, if ever, be met with in cases where the external or middle ear is the only seat of disease.

Congenital Deaf-Dumbness. Deaf and Dumb Cousins.

James B., æt. 27, a strong man, of fair complexion, a native of the West of Ireland, is a deaf-mute; his deafness appears to have been congenital, but it is not associated with any morbid condition of

the auditory apparatus which can be reached by the ordinary means of diagnosis ; the external meatus, the membrana tympani, the nose, mouth, palate, pharynx, the larynx, Eustachian tube, and tympanum presenting no characteristics of existing disease.

The patient is one of a family of five children, three male and two female ; of these the first two are deaf-mutes ; the eldest, "a fine young woman," lately engaged as a domestic servant in Wavertree, and the next, a brother, whose case is here related.

The father and mother are healthy, and hear and speak well, but a cousin of the patient, the son of a paternal uncle, is deaf and dumb.

The patient was married three years ago ; his wife hears and speaks well, and his daughter, now two years old, is a lively and intelligent little girl, in countenance very much resembling the father, but possessed of good hearing and speech.

The patient is a clever and intelligent man ; he appreciates well anything that is jocose, and his countenance brightened up in a most interesting manner while his wife gave a little account, and with much *naiveté*, of the difficulties they had during courtship, when, now and then walking on the banks of the

Liffey, "the poor young man was not able to speak," and adding, with a neat, plaintive, and Hibernian tact, "sure, if it had been myself that could not speak, it would not have mattered so much!"

This anecdote is not altogether irrelevant; it shews the value of that attainment in reading the lips, which some deaf-mutes seem to make instinctively and with facility, and which appears to be so worthy of recommendation in all cases where its acquisition is not opposed by formidable difficulties.

Congenital Deaf-Dumbness, occurring in descendants of the
same Grandfather.

Mr. Philip B., lived in the town of Kilkenny; he was twice married; had sixteen children by his first wife, and four by the second.

Mr. B. died at the age of about sixty-five, when four only of these twenty children were living, the others having died young. At this time (1856), Mrs. Catharine K., now fifty-three years of age, is the only one living of the twenty children above named; this Mrs. K., who is one of the daughters

of the second wife, has a deaf and dumb daughter, now twenty-eight years of age; and her half-sister, Mrs. H., a daughter of the first wife, had seven children, four hearing, and three deaf and dumb; the former are all dead; the latter, or deaf and dumb children, are all living.

Miss K., who is now, as above stated, twenty-eight years of age, is totally deaf and dumb; but there is no anatomical defect in connection with the auditory organ, which is within the reach of physical diagnosis.

The intelligence of this young lady is excellent, she writes well, and has many accomplishments; her taste in dress is said to be very good, and she is evidently fond of fashionable attire—a feminine characteristic by no means unique.

The mother gives a remarkable account of the age she had attained to before her deafness was even supposed to exist. When she was about two and a half years old, a gentleman, a friend of the family, shocked her mother by declaring his belief that she was deaf; before this time, she had been for six months an inmate of an infant school, where her want of hearing had not hitherto been discovered, at

any rate, strange as it may seem, communications respecting it had not been made to her parents.

It is not known that any of the children of Mr. B. (the grandfather) suffered from congenital deafness, but several of them seem to have died very young, so that the information on this point is incomplete.

The established and interesting fact is, that Mrs. H., one of his daughters by his first wife, has three deaf and dumb children, and that Mrs. K., a daughter by his second wife, has one deaf and dumb child ; the husband was not a blood relation to the wife in either of these cases where deaf-dumbness occurred in their offspring.

It is possible that the husbands of Mrs. H. and Mrs. K. might, by coincidence, be the sources whence the deaf-mutism was derived, but it is more probable that there was one main source for all, and that this was the maternal grandfather, Mr. B.

A corresponding fact has been already noticed in connection with congenital deafness occurring amongst the lower animals ; in this instance, however, the congenital deafness was derived from the mother.

A popular belief has prevailed that deaf-dumbness is more frequently derived "from the father's blood."

It is not uncommon for the same parents to have more than one child suffering from congenital deaf-dumbness, but it is exceedingly rare for the same father to have deaf and dumb children by two different mothers ; deaf and dumb children are often found to have deaf and dumb brothers and sisters, but for them to have half-brothers or half-sisters deaf and dumb is an occurrence that but few observers meet with ; its rarity, however, is in part accounted for by the simple fact that those who have deaf and dumb children are not altogether very numerous ; hence, the few amongst them who marry a second time must form but a very small group, a consideration which, in some measure, disposes of the importance of the apparent “rarity” in question.

In the case last related, we seem to have deaf and dumb grandchildren, through the medium, if so it may be expressed, of two different mothers ; viewing the matter, of course, in connection with its most obvious probabilities, and apart from associations apparently less worthy of attention.

Two brothers, middle-aged men, have lately come under my notice, both are deaf and dumb ; the deafness congenital, in both cases ; they are clever men,

ingenious mechanists ; their avocation requires the employment of steam-engines, the working of which they manage ; and in connection with their engines they have made some adaptations of machinery of their own contrivance, which attract attention and command admiration ; both are single men, but one of them is the father of an illegitimate deaf and dumb male child ; with these three it is not known that other deaf, or deaf and dumb relatives, are connected.

This case appears to supply an instance of deaf-mutism derived, as it is expressed, “through the father’s blood.”

Of the two deaf and dumb brothers above mentioned, one *excels* as a mechanical inventor ; he attends to his engine, and seems to watch, and, as it were, study it, but is not communicative ; while the other brother, whose mechanical ingenuity is relatively less, is very communicative, and with the aid of an expressive countenance, and gesture,—in other words, with mimic language, or the universal language of signs, for the employment of which he seems to have a remarkable aptitude,—he describes the steam-engine and its operations, and points out the modifications

which certain parts of the machinery have received from himself or his brother, in order to adapt them to special functions.

Difficult as this task of symbolic description might appear to be, it is evidently entered upon not only with willingness, but with pleasure, and with a consciousness, not less apparent, of being able to carry it out to the satisfaction of those who attend to it.

Congenital and Hereditary Deaf-Dumbness. Four Deaf and Dumb Children in a family of Seven.

Where the parent, on one side, has deaf and dumb relatives, we often find a deaf and dumb member in the family, sometimes even more than one, but where both parents have deaf and dumb kinsfolk, hereditary influences are yet more likely to tell upon their progeny, and, in such circumstances, we are not surprised to meet with whole, or nearly whole families, of deaf and dumb children.

In the case next following we have an interesting illustration of this statement ; the father has a deaf and dumb relative, the mother also has a deaf and

dumb relative, and of their seven children four are deaf and dumb.

Mr. and Mrs. E. were each twenty years of age at the time of their marriage. A maternal uncle of Mr. E. has a son deaf and dumb, who is now about eleven years of age. A maternal aunt of Mrs. E. has a daughter who has two children, a son and daughter, and both are deaf and dumb.

FIRST CHILD.—Nine months and three days after marriage, Mrs. E. gave birth to a son, who had good hearing, and was in all respects "perfect," but he died of "thrush" at the age of six months.

SECOND CHILD.—About fourteen days before her second confinement, Mrs. E. met with an accident; she fell down, and shook herself very much; she never felt any movement of the child after this accident; it was a girl, and still-born at the full time.

THIRD CHILD—A fine girl, now ten years old, deaf and dumb from birth; there is nothing abnormal discovered in connection with those parts of the auditory apparatus which can be subjected to physical examination.

FOURTH CHILD—A boy, now seven and a half years old, is deaf and dumb; all the visible parts of

the organ of hearing are apparently of normal formation. In this case, although the hearing is far short of what is required for the acquisition of speech, very loud or shrill sounds, such as a watchman's rattle, or a very loud and shrill whistle, can be perceived.

FIFTH CHILD—A boy, now five years and eight months old, deaf and dumb from birth, hears loud and shrill sounds, but even less than the fourth, or last mentioned child.

SIXTH CHILD—A girl, now three years old, hears well, and is, in all respects, "perfect."

SEVENTH CHILD—A boy, now fourteen months old, was found to be totally deaf shortly after birth; he is insensible even to the loudest sounds.

It is worthy of remark that there is considerable difficulty in ascertaining the state of audition of very young children, so that a very decided opinion respecting their hearing should not be given at an age so tender as that of the last mentioned child.

It is a vulgar opinion that the first is commonly the finest child, and on this sort of notion the privileges associated with primogeniture have, perhaps, in some measure, been based; it would be interesting to know with regard to families such as the above noticed

in what proportion the first child belongs to the deaf and dumb group; and the fact would be the more curious if this proportion were found to be very small.

Congenital Deaf-Dumbness.

July 1, 1856.—Wm. Henry T., æt. $3\frac{1}{2}$ years, is a fair-complexioned boy, with blue eyes, and a very intelligent countenance. From the time of his birth the patient has had good health, which has not been disturbed by any occurrence, with the exception of “a fit,” which he had, twelve months ago, and another fit about four months ago; both these, however, occurred after the deaf-mutism was known to prevail.

The patient has never appeared to his parents or friends to be capable of hearing any sound, and he is, of necessity, dumb, as well as deaf; his mother says that he once uttered the expression “ma, ma,” and said “ba” on another occasion; it is not known that he ever attempted any other articulate sound.

No cause can be assigned for the congenital deafness; it is not accompanied by any morbid condition which is apparent, and, with the exception of the functions of hearing and speech, everything appears

to be in normal condition. The larynx is small ; the tongue, rather small in size.

The parents of the little boy are each about thirty years of age ; they have now been married about six years, and have three children ; this deaf and dumb boy is the second child ; the others are daughters, one older, the other younger than the patient, and without any defect in hearing, speech, or other function.

The parents of the patient were not relatives before marriage, so that the effects of consanguinity have not been brought into play ; and it is not known that either parent has any deaf and dumb relatives, near or remote.

The little fellow allows the most pains-taking examination of the ear to be made, without any cry or complaint, so that the sunbeam is carried to the surface of the membrana tympani, which is seen to display its normal glistening appearance within the extremity of the speculum.

It does seem that the deafness is not quite complete ; for, a watchman's rattle being struck into rapid action, the patient turns his head, as if to look whence comes the shock, but the ear is not affected by the vibration of the tuning-fork.

Congenital Deaf-Dumbness. Imitative Articulation of the Deaf
and Dumb.

Jane J., æt. 25, a young woman of light complexion, with blue eyes, and intelligent countenance, suffers from congenital deaf-dumbness, for which there is no *apparent* cause, either predisposing or exciting; the aspect of the ear, like that of all her other organs, being normal.

Watching the mouth of her mother, this patient attempts the imitation of language; she does not, however, succeed beyond one syllable; in polysyllabic words it is only the first syllable that she is able to utter.

Such instinctive efforts (if so they may be called) at the mechanical imitation of the motions of the organs of speech are worthy of very careful study, for they evidently suggest the importance of teaching the deaf and dumb to read the lips and countenance of those who speak, and thus to get into the way of imitating what they may be enabled to read, as *one* means of expressing their emotions, or of communicating their impressions, thoughts, or desires.

The want of success in efforts of articulation, in this case, shews how much nature requires the aid of art in such a matter.

Imagine for a moment the misfortune of a human being possessing a peculiar mental aptitude for the acquisition of language, but unable to hear its sounds; mind, memory, energy, but without the aid of hearing !

For those who have not observed and studied the deaf and dumb it may be difficult to believe in the existence of such capacities, or to understand how their presence is determined ; those, however, who are zealously engaged in the teaching of deaf-mutes have been able to find them out.

A congenital deaf-mute, an interesting young lady, mentioned by Blanchet, pronounced English, French, and German, and displayed great aptitude for the acquisition of language. It is not surprising that such cases are rare, for their very creation, if so we may express it, requires the coincidence of at least four important requisites—great power and great will, on the part of both pupil and teacher.

This kind of rarity, however, is the more worthy of especial notice, because of the fact that the majority of such cases must be kept out of sight, for want of

that concurrence of circumstances which is essential to their appearance or display.

The wider the fields of science are spread, the less will be the dominion of marvel; hence, also, the value of records which take charge of the history of that which can be done by pains-taking, patient, and rational efforts.

The instance just mentioned, of a congenital deaf-mute attempting to speak, may be contrasted with another remarkable case, in which a speaking female having, in great measure, lost her hearing, gradually adopted the language of signs, and employed this as the means of communication with her husband and children, although she could yet hear when loudly shouted to, and retained her power of speech all but unaltered.

The lady here alluded to is about thirty-six years of age, and has lately come under my care on account of an affection of the tympanum; her deafness has been extreme, and is even yet very great; nevertheless, a marked difference in the power of hearing has followed the treatment employed: she is at present able to hear the cries of her youngest child, which she had never heard before; at a recent visit she

announced this alteration in audition with a cheerfulness far exceeding that which commonly plays on the countenance of the deaf.

Her husband was recommended to guard against the exclusive employment of finger-talk, to the practice of which both he and his eldest child had already become initiated, lest, in this way, his wife should gradually be less accustomed to intercourse by oral language, so as to lose, or not to acquire, the habit of reading it on the lips of others, and, at the same time, become less familiar with its utterance ; to which it might have been added, that the employment of language in human intercourse is far superior to dactylic signs, or to other gesture, or pantomime, in the influence it exerts in connection with temper.

In cases of acquired deafness, where the cophosis is complete, but where the power of speech is yet retained, it is very difficult, in many cases, to have this power kept up and exercised ; visible signs being easily understood, and sounds not heard, the deaf person often becomes more willing to attend to the former than to the latter.

If such difficulty prevail with regard to those who *can speak*, how much greater must it not be with

those who have the art of speaking to learn, by the mechanical imitation of the well-watched lips of others, and without the aid of the ear?

If the lady whose case is mentioned above were left to the non-speaking tendency which is so manifest, in the course of time she would, probably, rely almost exclusively on the language of signs, and might ere long say with Dr. Kitto, "My own present facility of speech stands me in little stead, beyond the walls of my own house. I do not find real occasion for it ten times in a year."

The language of deaf-mutes, if this expression may be tolerated, should be regarded as the entire group of all their means of communication, with one another, or with those who hear and speak. The employment of the body generally, but more especially of the extremities, in gesture, of the facial muscles in the expression of the countenance, of the vocal tones, of the fingers in dactylic talk, &c., are all important, but wherever the vision is good, so that language can be read on the lips of others, and where at the same time there is the required aptitude for its imitation, there can be little doubt of the pre-eminent value of the vocal apparatus, of the tongue, and other organs

of speech, as an additional means of intercourse ; to which, the art of writing being added, the deaf-mute is raised, by the efforts of christian philanthropy and modern science, to the proud position of a cultivated, intelligent, agreeable, and responsible being, taking part in the joys as well as in the woes of his fellow-men, and capable of appreciating his psychological, as well as his physical condition.

The power and will of the teacher to instruct, and of the pupil to learn, with the age, social position, occupation, and destination of the latter, must be regarded as important considerations in every case where any attempt at teaching oral language to a deaf-mute is contemplated ; for the difficulty of the task, with the uncertainty of results, being taken into account, it always becomes a question as to whether such an undertaking be desirable ; while it is so, doubtless, in some instances, it is evidently not so in all.

There is an unfortunate difference of opinion with regard to this matter amongst teachers of the deaf and dumb ; some say that attempts at teaching oral language to deaf-mutes are worse than useless ; others that the acquisition of speech should be regarded as their greatest and most important attainment.

This difference seems to be connected, in great measure, with the fact that few, if any, of such teachers, are *equally* versed in any two methods of instruction, or equally accustomed to communicate with their pupils by means of finger signs, and lip signs. Any able teacher, fully competent for the two modes of instruction, selecting a dozen deaf-mutes, in corresponding condition (as nearly as may be), and educating one half of them with the aid of dactylography alone, while the other half-dozen were taught lip signs, or oral language only, during the same time, might thus be enabled to form a comparative estimate of the difficulties and results of the two methods.

The expression "lip signs" would seem to be admissible here, for to the deaf-mute the different positions and movements of the lips, not to mention other parts of the organs of speech, must be watched, and read as signs, just as much as the different positions and movements of the fingers; unfortunately, the labial apparatus being small, and its motions rapid, or, at any rate, not made sufficiently slow without some difficulty, its visible tracings are far less distinct than are those produced by the fingers, even where the speakers are sufficiently approximated, but when they

are separated by the distance of a few yards, as on the opposite sides of a large room or public building, the finger signs may be available when lip signs would not.

We must not overlook the important difference there is between a congenital deaf-mute, who never heard the sound of language, and, of course, never spoke it with the aid of the ear, and a person who has become deaf after previous hearing and speaking, as far as reading the articulations of those who speak may be concerned; the difficulty for the former must be infinitely greater than for the latter.

Let any Englishman not at all acquainted with the German language listen to the reading of a page of Göethe, and watch the lips of the reader, and attempt to analyse the visible motions observed, with the intention, or hope, of remembering them, without knowing what they signify, and he will have some idea of the manner in which the eye and the head of a deaf-mute must be taxed in the earlier period of his efforts to read articulation on the lips of those who speak.

Let any one not acquainted with the language of such books glance at a page of the Zend-Avesta, of

the Laws of Menu, or of the Koran, in Zend, Sancrit, or Arabic, and try to remember the fixed and settled forms of the letters as a means of possessing his mind of the character of the page, and he will be able to picture to himself the first difficulties of a deaf and dumb child in reading, not the settled forms, but what we may call the agitated conditions of the lips, curling under human emotion, and played upon by oral language.

When, however, one special signification is known to belong to any one particular condition or movement of the articulating apparatus, when the pupil has been taught to observe this in those who speak, and to associate it with the thing signified, as well as to imitate it by his own organs, he begins to enter upon the less difficult, as well as the more agreeable part of his task; he has got some hold on the instruments of progress, so that his somewhat advanced state may be compared to that of the Oriental scholar, who already seems to master the rather forbidding alphabet of the language he begins to study.

In observing attentively the manner in which very deaf people seek to communicate with and to understand their associates, considerable differences may be

noticed : some instinctively, as it were, proceed to reading the lips, and make good progress in this art, while others do not appear to be at all attracted to this mode of communication, and adopt the medium of manual or digital signs, even when possessing the power of speech, as in the case of the lady above noticed ; while all intelligent deaf, or deaf and dumb people, who enjoy good vision, are more or less readers of the gestures and expression of countenance which so often accompany both oral and digital speech.

The facility with which some very deaf people are able to read the lips of those who address them requires to be carefully borne in mind, and, as it were, guarded against, as a possible source of error in inquiries which relate to their deafness, but more especially to the degree or intensity of it ; this remark may be illustrated by the following observation.

A few days ago, two ladies—sisters—the one of thirty-two, the other of thirty-four years of age, from the neighbourhood of Chester, called upon me respecting their deafness, which, in the former, was very great, in the latter, extreme.

In the lady of thirty-two, the opacity, and apparent thickening of the membrana tympani, were

very remarkable, on both sides, but there was free communication between the throat and the tympanum on both sides, so that the Eustachian tube did not appear to have undergone any morbid alteration that could be diagnosed with the aid of the otoscope; in the case of her sister, the condition of the membrana tympani was much the same, but the ingress of air to the drum was barely audible, so that it seemed probable that the free space, or cavity of the tympanum, and Eustachian tube, had been considerably lessened by the progress of morbid action, and hence, in her case, the deafness was much greater, to say nothing of alterations in the labyrinth, which may have accompanied or followed the primary changes in the tympanum.

In both cases the deafness commenced at the age of sixteen, without apparent cause in the younger sister, but in the elder, whose deafness is so extreme, the loss of hearing was attributed to the effect of a course of cold shower baths, which were employed for the relief of chorea; whether or no these shower baths had any effect in producing the aural disease may be a question (probably they had); but *after* its occurrence the patient employed "*brandy and salt*," dropped

into the meatus, as a remedy, after which, as may be easily believed, the deafness became very much worse.

The state of hearing in this case was tested in various ways; when a large ear trumpet was being employed, the patient said that she heard what was said to her quite well, and certainly gave correct answers to the questions which were put; but it was discovered that, in reality, she had not heard anything that was said, having read the questions on the lips, without at all hearing the voice. By way of arriving at less doubtful, or more positive results, she was requested to put on a pair of opaque spectacles; which are found useful in such observations; thus covered, the eyes could no longer be brought to her aid, when it was found that even loud speaking, with the aid of the ear trumpet, was, to her, quite inaudible.

This interesting case shews how easily, or how completely, some acquire the art of reading the lips, without the aid of any special instruction directed to such an attainment, for, of such, this lady had never availed herself, necessity being, with her, the mother of that constantly repeated observation by which she reads so well the countenance and lips of those who address her.

A remarkable case of an opposite kind came under my notice, a few days after the above observations were penned ; a gentleman, of forty-five, was accompanied by his wife, who spoke of him as completely deprived of hearing ; during the last twenty years he has been totally deaf of one ear, and four years ago he lost the audition of the opposite side.

He hears nothing of the vibration of the tuning-fork when applied to the head, on either side, and the employment of the ear trumpet has not the slightest influence on his audition ; with it, or without it, he can hear no ordinary sound, a state of things which seems to depend on disease affecting the auditory nerve. There is nothing abnormal to be *seen* in the organ of hearing.

This gentleman has not made the slightest attainment of any kind in the language of signs, and appears not to have any notion whatever of the art of reading the movements of the lips of those who address him.

It is, however, worthy of notice that the gentleman here alluded to is less favourably placed than is the lady last mentioned, as far as the study of labial movements may be concerned ; his occupations are out of doors, and he sees but few people ; while the

lady resides with her sister, they pass their days together, in the same parlour, and have constant opportunity of practising conversation with the aid of the eye.

The ordinary character of female intelligence, their tact, facility of observation, and imitative power, are favourable to the acquisition here alluded to, while their domestic position, society, occupations, and habits, all tend to facilitate and help its attainment.

Females, in general, and the mothers of the deaf in particular, will often be found the best teachers of such means of communication.

It is worthy of mention that the art of reading the movements of the lips may be more difficult with some nations than with others ; the nature and extent of the alphabet, or rather of the elementary sounds of a language, must tell upon this matter ; even amongst the languages of the British Isles this is apparent, where the Scottish and Hibernian dialects of the Celtic, have a shorter, and, apparently, simpler series of elementary sounds than the Welsh, or even than the English.

Amongst European tongues, generally, the dialects derived from the ancient language, or languages, of

Rome, and neighbouring Italy, as well as the various forms of Germanic speech, having a less complicated series of elementary sounds than those employed by the Sclavonic nations, it might be supposed that the reading of labial and other movements of articulation would be more difficult in the latter than in the former.

It may also be stated that, in some of the languages alluded to, as well as in many of the Oriental tongues—Indian, as well as Shemitic—where the alphabet has a long series of letters, as in the Sanscrit, or in some of the Indian dialects derived from it, which are spoken in the present day—Hindostanee, for instance—or in the Arabic, of the Shemitic stock—several of the elementary sounds employed in speaking are formed so far back in the mouth, or so deeply in the throat, that their value, as displayed in the movements of the lips, must be much more difficult to be seized than is that of expressions employed in what we may call the more vocal, or vowel language, of the South of Europe, such, more especially, as the Italian, and a great part of the Spanish,—to say nothing of the still more eminently vowel languages met with in some of the islands of the Southern Seas.

This “reading of the movement of the lips” is

an expression which is incomplete, or not sufficiently comprehensive ; for we require, in some measure, to mark the movements of the teeth and gums, which may be regarded as an index of the motions of the lower jaw, to say nothing of that which is displayed by the function of the tongue, and the other parts more or less seen in connection with the act of articulation.

Any morbid condition affecting the movements of the lower jaw, of the tongue, or of other parts employed in articulation, must, of necessity, impart to this act more or less of an abnormal character ; this may be recognised in the nature of the sounds produced, or in the visible movements of the organs of speech, and frequently in both. In a case where I lately removed the left side of the lower jaw—an operation required by disease of the bone—the movements of the lips, and other parts employed in articulation, were very much altered by the diseased growth, but regained an approach to their normal character after the gentleman recovered from resection of the maxilla.

To say that injuries of the lower jaw, glossitis, with, or without the influence of mercury, cancer of the lip,

or cancer, or fungoid disease affecting the tongue, the salivary glands, or neighbouring parts, interfere seriously with the mechanism of articulation, is merely to state what every one knows; hitherto, however, the nature, varieties, degree, and complication of such interference have not been much attended to.

In the anatomical study of cases of congenital deafness, we should first carefully ascertain whether all the parts belonging to the auditory apparatus, in its encephalic, and temporal divisions, are really present; in the next place, the position and connection of these parts should be studied, while a very especial attention is required to enable us to ascertain whether they have their normal *size*, and *structure*, and whether the parts which, in the natural state, yield, be rigid, or stiff, from morbid condition, or whether the cavities or canals of the organ are charged with anything, more or less, than their normal contents.

In cases of congenital deafness, whether in the human subject, or in the higher vertebrata, we commonly find that the exterior conformation of the body in general, as well as of the aural region and ear in particular, is normal; frequently the membrana tympani, appearing to be perfectly healthy, is seen, while

the handle of the malleus connected with it is plainly discerned, so that the external ear, the meatus externus, the membrana tympani, and the outer extremity of the chain of ossicula, are thus, during life, examined without any deviation from the normal type being discovered; at the same time, inflation of the tympanum, by way of the Eustachian canal, may be practised, and thus the patent condition of this tube, as well as the free state of the tympanum, determined; and hence, from the exterior we seem to travel nearly as far as the labyrinth, without hitting upon any departure from the ordinary or healthy anatomical forms.

So much for the travel towards the labyrinth from without: in the next place, we commence with the brain, and pass towards the labyrinth from within.

Intelligence is often found to be good; perception, memory, judgment, and imagination, acting as their own witnesses, may all seem to declare their normal condition; hence, we infer that the brain is sound, and that the individual enjoys a normal cerebral development; the senses of touch, of taste, of smell, and of vision—to say nothing of the muscular, or sixth sense—may all be perfect; the portia dura, or facial

nerve, so intimately connected with the auditory chord, may display no morbid phenomena, or abnormal condition ; so that, in this way, we seem to arrive at the auditory nerve, in connection with which, within the skull, and within the labyrinth, the source of congenital deafness has to be studied.

The intra-cranial chord and the labyrinthic expansion, or aural retina of the auditory nerve, must be separately considered ; the structure of the former is comparatively simple, while the distribution of the latter is very complicated ; hence, it is easy to suppose that abnormal development, and consequent want of power, is more likely to occur in the more complicated than in the more simple part of the auditory nerve ; and, further, that the development of the labyrinth being associated with, and, as it were, measured by, the development of the nerve it encases, there is good reason to expect a departure from the normal type in the bony case of the labyrinth itself, in those instances where the want of audition suggests the idea that the nerve, and the parts more immediately connected with it, are at fault ; and, forasmuch as in such instances we are minus, more or less, of a function, it is not unreasonable to infer that more or less of structure

will be wanting, or interfered with, and these indications lead us in theory to that which in practice we discover, namely, that in the majority of instances of cases of congenital deafness there is a want of development, or an abnormal condition of that part of the nervous system which belongs to the auditory apparatus. The bony structures which surround the essential instrument of hearing are to be distinguished from this instrument itself; a snail-shell may hold its helix, either alive or dead, and the beautiful spiral of the human cochlea may be lined by a nervous expansion which responds to the vibrations that reach it, or it may be wanting in that curious and special vitality which recognises the pulses of sound that strike upon its circular walls.

There is no doubt that it requires a very practised eye to detect any of the minor deviations from the normal condition which may be met with in the internal ear, and nothing short of a long experience in the dissection of ears, both in the healthy and diseased states, can fit us for the practical application of this department of anatomical analysis.

In cases where hearing and speech have never been exercised, we need not be surprised to find that the

nerve of hearing and the motor nerve of the tongue are abnormally small.

This was remarkably the case in a deaf and dumb boy, five years and eight months old, who died of croup, on the 21st November, 1855.

This patient was clever and intelligent, and had commonly enjoyed good health, but from the earliest period of his life had been totally insensible to sound, and, of course, had never attained the power of speech ; the head, the external ear, meatus, and membrana tympani were well formed.

On *post-mortem* examination, the larynx was found to be filled by a very thick tube of false membrane, produced during the attack of croup, and, in itself, quite sufficient to account for death.

The tympanum, on both sides, was found to be choked, if this expression may be employed, by a pale greyish mass of apparently inspissated mucus ; there was no other morbid appearance seen in the tympanic cavity, the ossicles, the membrana tympani, and the membranes of the fenestræ being in normal condition.

The Eustachian tube was sound and pervious.

The roots of the auditory nerve were exceedingly small—faint white lines—and the trunk of this nerve

was still more remarkable for having less than the normal size.

The small size of the lingual, or motor nerve of the tongue, was also remarkable; the glosso-pharyngeal nerve was also very small, and the thyroid body had less than its normal dimensions.

The gustatory nerve was large.

In the internal meatus abnormal appearances were not observed; but the vestibule, semicircular canals, and cochlea, seemed all to have less than their normal dimensions—due regard being had to the age of the patient.

It is not improbable that the progress of morbid actions connected with the attack of croup had told, in this case, upon the condition of the tympanum; although it is by no means quite certain that this was the entire source of the material with which the cavity of the drum was charged.

Cases of congenital deafness depending solely upon morbid conditions of the tympanum, with or without mucous accumulations, are undoubtedly rare; it should, however, be borne in mind that the diagnosis of the state of the drum should always be established, if possible, before prognosis is given, or treatment recommended, in cases of deaf-dumbness.

In this case the larynx, as a whole, seemed to be smaller than usual, and hence its tube the sooner filled by the false membrane above noticed.

In cases of mutism, it is easily understood that the development of the larynx is less favoured than it is in the normal state, or where voice and speech are fully employed.

In another case of congenital deaf-dumbness, in a girl, of nine years of age, who died with serous effusion into the ventricles of the brain, which followed an attack of scarlet fever, careful examination of every part of the auditory apparatus was made, but without the discovery of any deviation from the normal anatomical conditions, with the exception of an apparently small size of the trunk of the auditory nerve, which, having reached the bottom of the internal meatus, divided, and was distributed in the usual manner.

In a very careful examination of the ear of a large male pig, believed, with good reason, never to have heard any sound, I find the portion of brain connected with the auditory nerve to be sound, and the nerve itself passes to the bottom of the internal meatus, without hitherto displaying any abnormal condition. On the other hand, the external ear, the meatus, membrana tympani, and ossicles, are all found in

normal condition, so that the state of the internal ear or labyrinth is all that remains for consideration.

The small, and very hard portion of bone which encases the termination of the auditory nerve, and contains the internal meatus, the cochlea, semicircular canals, and vestibule, and which is seen to hold the stapes, sunk upon the border of the fenestra ovalis, is so tiny, that it rests upon the thumb nail, which it does not entirely cover; it is, in general, of trapezoid form, but covered by little irregularities, eminences, points, and depressions, and when placed in the scales is found to weigh only thirty grains; from all which it may be inferred that the labyrinth must here be reduced to the very minimum of development for an animal of such dimensions; and on comparing the portion of bone thus described with the corresponding one taken from another and hearing pig, for the sake of the comparison, the latter is found to be the larger of the two.

The same observation is true of the ears of two cats, one hearing, the other deaf from birth; in the latter the semicircular canals and cochlea were less than in the former.

Congenital Deaf-Dumbness. Violent Temper.

October 28, 1856.—Isabella B., æt. 6 years, a healthy-looking little girl, with dark hair and blue eyes, a native of Newry, is deaf and dumb. The deafness is congenital, the patient never having betrayed the least sign of audition.

This little girl has a brother, eight years old, who hears and speaks well, and another brother, ten months old, who also hears.

There is no deaf, or deaf and dumb person amongst the relatives of either parent; and no satisfactory physical, or physiological cause, can be assigned for the origin of this want of audition.

There is nothing abnormal to be discovered in connection with the ear, or any neighbouring part.

In this case the temper of the patient is characterised by that peculiar violence which is often observed in the untutored deaf and dumb, and on account of which their early and methodic training is so desirable.

In cases of this kind the invention, or imagination of the mother, often goes a great way in quest of a cause for the malady; and in this instance a ghost-story is brought to bear upon the matter.

The mother says "When I was in the family-way of this little girl we lived in a house that was haunted ; we heard terrible noises every night, and I was constantly frightened ; we got clergymen and others to come to the house ; they heard the noise, but could not do anything to stop it ; one young man, however, brought pistols with him, and fired them off in the house, and this seemed to stop it for a while. I always thought that this was the cause of my child being deaf and dumb."

Supposing the facts to have corresponded to this account, we cannot fail to admit that this female suffered from great and painful impressions during the whole period of utero-gestation ; by such impressions, which were received through the medium of the *auditory nerve*, her nervous system was doubtless kept in a morbid condition, ill suited, it may be, to sustain that so called *nitus formativus* which is essential to the progress of the normal development of the new being during the period of intra-uterine existence.

An individual fact of this kind should not be lost sight of, however much it may seem to be associated with a popular superstition, for, if such a superstition

have a real psychological or physiological effect, it has hence a value, which requires to be weighed in the balance of philosophical and medical inquiry.

Cases of Mutism.

It very rarely happens that human beings possessed of that which may be regarded as normal, or average mind, and, at the same time, enjoying the sense of hearing, are wanting in the power of speech. The functions of the tongue, in general, are so important to life, and to the relations of man with those who surround him, that nature seems to have taken especial care of this part of the articulating apparatus, the simplicity of its structure being, perhaps, one great means of protecting it from attacks of disease, and of preserving its organisation with little change in the majority of instances, even to very advanced periods of life.

When the eye is dim, when the acuteness of hearing is lost, when the flowers of the field no longer delight the smell, as in earlier life they were wont to do, the sense of taste is often well retained, and speech may yet continue to be vigorously exercised ; the treasured

results of experience, and the venerated privileges of wisdom, displacing, as it were, the characteristics of youth, and the volatile language of emotion.

Rare, however, as mutism may be, it is sometimes met with ; and amongst the few cases which are here given, by way of illustration, some facts relating to its modes of origin, and which are not without interest, in a practical point of view, will be found.

Infantile Epilepsy. Mutism.

February 12, 1854.—Isabella R., æt. 2 years, suffers from frequently occurring fits of epilepsy, having now and then had as many as a dozen fits in twenty-four hours ; these attacks commenced at the age of eight months, and have continued ever since, at a rate, on the average, of about eight or ten fits a week ; occasionally a day has passed without a fit, but this occurrence is rare.

Previous to the epileptic attacks “she was a bright, sharp child,” but has now become dull, stupid-looking, and heavy, and *makes no attempt at speaking*, although the hearing does not seem to be imperfect, and the organ of vision appears to be in normal condition.

Epilepsy. Mutism.

November 1, 1855.—John Arthur T., æt. 3½, a fair-haired and light-complexioned little boy, had perfect health until he was two years old. “At this time he was getting on very well in his talking, could ask for anything he wanted, and could make himself understood without difficulty.”

He now “began to suffer from fits,” which commenced without any known cause, and occurred several times in the course of the day, and have continued to do so ever since.

With the progress of the epileptic affection his infantile speech left him, and he is now in a condition, at first sight, resembling that of a child deaf and dumb from birth; it seems, however, that he can hear, when sufficiently roused, but he no longer makes any effort to speak.

The patient has no appetite in a morning, but is ready for a meal towards eleven o’clock.

Rubbing the anus, and picking the nose, are mentioned by the mother as symptoms which have attracted her attention.

The tongue is clean, the bowels are regular, and the alvine evacuations have a normal appearance. The urine is turbid and "whitish looking;" it is passed very often during the day, but the patient sleeps all night without voiding it.

November 15.—The patient has lately taken a little aperient, and tonic, and anthelmintic medicine, but without any effect on the epileptic attacks.

It is remarked by his mother that he is deprived of all articulate language, with the exception of an exclamation that he makes when he feels the fits coming on, calling, at such times, "hoo! hoo!"

It seems not improbable that irritation of the mucous membrane of the intestines, caused, probably, by the presence of worms, may, in this case, have given rise to the epileptic attacks, and thus, indirectly, to the state of deafness and mutism.

Is there any reason for supposing that intestinal irritation of the child in the womb is ever the main forerunner of congenital deafness?

In young children we notice two remarkable causes of loss of hearing—

First, Those acting upon the auditory nerve in particular.

Second, Those telling upon the nervous system in general.

If cases of acquired deaf-dumbness be attentively studied, most of them will be found capable of being referred to one or the other of these sources.

It is evidently a matter of great interest, and of some importance, to consider how far corresponding causes may act in the way of damaging the auditory organ of the child in the womb; at what period of intra-uterine life such morbid actions are most likely to take place, and in connection with what states of health, or of deranged health, of the parents (but more especially of the mother); to say nothing of their habitat, of the health of their forefathers, their occupations, or the climate in which they live.

Such considerations have a practical bearing upon cases where there is one or more mutes, or deaf-mutes, in a family, and where it is probable that other children will be born of the same parents.

Here this question naturally arises—Is there anything in the constitutional condition, in the state of health, in the occupations, or circumstances of the parents, likely to favour the occurrence of morbid conditions in their offspring?

It is obvious that morbid conditions of the nervous system of the foetus should be more especially kept in mind; whether these arise out of abnormal development, out of some want of power in the *nitus formativus*, or whether they be produced indirectly by the disturbing influences of morbid agents acting upon the lining of the digestive tube, upon some other part of the mucous system, or even upon the tegumentary covering of the body.

Further, can such morbid conditions, or evil tendencies, be met by remedies, or in any way averted? Therapeutic indications are best suggested by pathological information, and where the latter is so limited the former can have little scope.

Mutism, after "Fits."

March 26, 1856.—Peter B., æt. $3\frac{1}{2}$, a fair-complexioned boy, with blue eyes, and healthy aspect, hears well, but is mute. When about two years of age he began to speak, and gradually attained the power of lisping a few short words, but no trace of this power of speech now remains.

In the nose, mouth, and pharynx, there are no morbid appearances to be seen, and the same may be said of the external ear and meatus, likewise of the exterior of the membrana tympani, on both sides.

The patient had measles when six months old.

The most important antecedent of the present condition is found in the fact that the little boy had three fits, twelve months ago, with intervals of a week.

The sister of the patient, a grown-up young woman, who now has the charge of him, says that the loss of speech was first noticed about two months after the above mentioned fits.

By virtue of what alteration in the nervous centres, or cerebral nerves, has speech in this case been lost?

The patient being as yet so young, is it probable that it will ever be regained, or acquired?

Both these questions are interesting to the medical inquirer; the latter is of great importance to the patient and his friends.

It is not improbable that morbid alterations have taken place within the skull, which interfere with the function of the nerves employed in the formation of articulate language; whether this have occurred in connection with sanguineous or serous effusion, with

ramollissement, or induration, or with the deposit of lymph, or other product of diseased action, are questions, the satisfactory solution of which, in the present state of matters, does not seem possible.

Speech becoming Defective after an attack of Scarlet Fever.

July 10, 1856.—Thomas R., æt. 7 years, a delicate looking boy, with hazel eyes, and dark complexion, had scarlet fever, when three years old; before this attack he spoke well, but has suffered from defective utterance ever since. The hearing was perfect before the attack of scarlet fever, and is so now, not having been at all damaged by this malady.

There is no morbid alteration to be observed in the mouth, or elsewhere, which might account for the difficult, slow, and hesitating speech of the sufferer.

There is a want of voice, as well as an imperfection in utterance, so that the speech is not only stammering, but in great measure aphonic, a fact which directs our attention to the larynx, as well as to the oro-lingual apparatus of articulation.

Amongst the relatives of the patient it is not known that any individual is similarly affected.

The value of this observation is evidently connected with its bearing on differential diagnosis ; in this case the hearing might have been injured by morbid conditions set up during the progress of the scarlet fever, and thus the speech might have been indirectly damaged or lost, and if such had been the case, the present condition of the organs of voice and articulation might have escaped that observation which is now of necessity directed to them.

At the time this little boy suffered from scarlet fever, there was considerable swelling at the sides of the neck, such as is often met with in cases where aural affection prevails.

The affection of the organs of speech, not preceded or accompanied by any strictly aural complaint, would be more interesting had it been observed from the time of its commencement ; there seems, however, to be no doubt of the fact that the defect from which the patient now suffers followed the exanthematous attack, and that it did not in the slightest degree precede it.

There is reason to think that, in cases of this kind, the disturbance of the power of speech is sometimes produced by effusion, or other morbid alteration within

the cranium ; this consideration, which seems worthy of particular attention, may be illustrated by the following case.

Speech becoming Defective after symptoms of Hydrocephalus.

J. H., æt. 4 years, a pale-faced, delicate-looking little boy, suffered, a month ago, from symptoms of hydrocephalus ; after active treatment the signs of cerebral irritation vanished, but in about a week it was found that the little patient was much less disposed to talk than before, and it was further discovered that, in attempting to speak, he could only do so very slowly, and very imperfectly, and in a somewhat singing sort of manner ; this unhappy state of the utterance yet continues.

The indisposition to speak met with in this case makes a very careful watching of the child of great importance, lest, for want of exercising the apparatus of articulation, its function should be further damaged, or completely suspended.

Affections of the head, in the early periods of life, are well worthy of attention, as they occur amongst our domestic animals : the convulsions by which some

of the feline tribe are attacked during dentition might profitably occupy the attention of the pathologist; and, in some of these instances, deafness, probably regarded as *congenital*, might be accounted for as *acquired*.

Partial Mutism.

April 12, 1856.—Thos. N., æt. $4\frac{3}{4}$ years, a fine, healthy-looking, dark complexioned, and intelligent boy, is unable to utter any word distinctly, and hitherto does not attempt the utterance of more than three or four articulate sounds. The patient made no attempt at articulation until he was nearly three years old.

The tongue is well formed, and active; it is of the normal size, and the patient protrudes it to the usual extent.

The mother of the little boy is now thirty-eight years of age, and healthy, his father is forty-five, and has been an unhealthy or ailing man ever since his marriage, now thirteen years ago; he had syphilis at the age of thirty, and perforation of the hard palate occurred twelve months ago, after he had suffered severely from rheumatic fever, during the progress of which a considerable quantity of mercury was taken.

The father of this patient, the man just alluded to, says that he was a late and bad talker, as a child; and further remarks that his eldest brother began to speak so late, as a child, that the next brother to him, whose birth took place sixteen months after, was the first of the two to speak.

In the father, who suffers from morbid communication between the nose and mouth, the great elevation and narrowness of the hard palate are very remarkable.

Mutism. Probable acquisition of Speech. Importance of early training to the art of Speaking.

July 10, 1856.—John C., æt. 5 years, a healthy boy, with blue eyes and fair complexion, has good hearing, but is “dumb.” He is the youngest of three children; the other two have good hearing and speech; the father of the patient is thirty-eight years of age, his mother thirty-six.

The father suffers from “an impediment in his speech”; as a child he spoke well, but “when a young boy” he was associated with playfellows who stammered, and he got into their habit.

There does not appear to be any malformation, or morbid appearance, to be discovered in connection with the nervous system, the organs of sense, or any other part of the body.

It is found that the vowels a, e, i, and o, can be uttered, but not so the u, as pronounced in the English alphabet ; the sound oo, as in mood, is produced, but the sound of the word *you*, or that of the letter *u*, cannot be formed.

Hitherto no similar attempt had been made to commence the utterance of the vowels, and the mother of the child was surprised to find him capable of pronouncing them ; this, however, was not all that he could do, for the consonant *b* was next employed before each of the vowels previously and slowly uttered alone, and a syllable with the two letters (the vowel and consonant) clearly and distinctly expressed.

Thus I had the gratification of giving to this little fellow his very first lesson in that art which is the characteristic, as well as the privilege, of the human being ; his mother, having brought him to me as a dumb child, went away with the conviction that with patience, gentleness, and care, she would be able herself, and without any aid from art, to confer upon

her son the elementary powers which should afterwards lead to the complete acquisition of speech.

This case is noticed for the purpose of showing the importance of commencing early with some rational method of teaching the art of articulation ; if this little patient had been tutored during the last two years by any one skilled in the speciality requiring attention, there is good reason to think that before this time he might have been master of a considerable amount of language.

The case is also worthy of notice as one of those which require to be studied in connection with the differential diagnosis of mutism and deaf-dumbness.

It is not improbable that this little boy might have remained for years without making any considerable progress in the acquisition of language had he been left to the unaided and undirected instruction of his parents.

Mutism. Family Mutism. Importance of early training to the art of Speaking.

Thos. H., aet. 6 years, is the second cousin of the last mentioned patient, (Mr. C. and Mrs. H.

being first cousins;) he suffers from a precisely similar defect, being hitherto unable to speak, but his hearing is good.

Walter H., aet. 15, is the brother of Thomas H., mentioned above; his hearing is good, and he now speaks very well, and is occupied in a merchant's office, but it is especially worthy of remark that he was more than eleven years of age before he could speak plainly, having suffered during the earlier years of life from the same inability to acquire the art of articulation which has hitherto characterised his brother and cousin.

When Mr. C. spoke to his cousin, some weeks ago, about the "dumb" state of his son, her remark was, "Do n't be uneasy; our boy, who is now fifteen, did not speak until he was more than eleven, and his younger brother is now six, and cannot speak yet."

In these cases we see difficulty in the acquisition of speech to be a sort of family failing, as far as these boys are concerned; but the same difficulty has not been met with amongst the girls of the two families; Mr. C. has two daughters, one of ten, the other of twelve years of age, who acquired their speech with the usual facility, and at the usual period

of infancy. Mrs. H. has four daughters, to whom the same sort of observation applies.

It is worthy of remark that efforts of training to the art of speaking seem to have been neglected with regard to the three "dumb" boys, their parents not being alive to the fact that by suitable tuition the speaking period of their lives might have been considerably lengthened, or, in other words, the time at which they began to speak anticipated.

Congenital Deafness. Late and Imperfect Speech.

December 1, 1855.—T. W., æt. 12 years, "has been deaf ever since he was born;" this deafness, however, is only partial, so that he has acquired the art of speaking, although in an imperfect manner; he began to articulate at the age of seven, having, as his mother expresses it, done "nothing but cry and squeal" before this age. He is not a clever boy; but the late acquisition of language should be referred, apparently, to defect of the ear, rather than to feebleness of intelligence, bearing in mind also, that, in all cases, mental conditions influence the acquisition and retention of language in a very remarkable manner.

By the frequent observation of cases of this kind we arrive at a truth of some practical importance, which may be thus expressed—

In cases where children first acquire language with the disadvantage of partial deafness, the faculty of speech is developed at a late period, and is at the same time more or less imperfect; such imperfection being more remarkable in cases where a feeble mind is associated with an imperfect ear.

The father of this little boy is a man of weak constitution, and has frequently suffered from erysipelas affecting the head and face.

There is no mute, deaf, or deaf and dumb person, amongst the relatives of the patient.

Partial Deaf-Mutism. Late and Imperfect Speech.

January 14, 1856.—Sarah M. C., æt. 46, a healthy-looking woman, of light complexion, is partially deaf and dumb. It is said that otorrhœa never occurred, but on examining the external ear the remains of a former otitis are found, and ear-ache is mentioned as having troubled the patient in the first six years of her life.

She never seemed to make any attempt at articulation until the age of six years, when, all at once, she surprised her father by calling a little boy, her play-fellow, by his name. It is not known that any relative of the patient is either deaf, dumb, or deaf and dumb.

The external meatus, in its bony division, is a little narrowed on both sides.

In the nose, mouth, palate, and throat, all the appearances are normal.

The membrana tympani is opaque, and apparently thickened, on both sides; these conditions have probably followed an attack of otitis in very early life.

The speech of this patient is very limited, very defective, and very disagreeable—conditions associated, apparently, with the fact, that when the practice of articulation commenced, partial deafness prevailed, and that a good state of audition, required for the normal development of speech, has never been attained to.

Certain letters of the alphabet are never employed in her imperfect language; of these the letter *t* is one; hence she is incapable of uttering the word *table*, and always says *cable* instead of it; for *th*, *d* is substituted, as in “*dere*,” for “*there*.” The united letters *sch* present also an insurmountable difficulty; hence

for the word *school* the patient always says *cool*; all this, it is readily seen, corresponds to the imperfect language of infancy, the characteristics of which the patient has never been able to leave behind her; in other words, the earlier or infant articulations have not been improved upon for want of an ear equal to the normal development of language.

Congenital Deafness. Imperfect Speech.

Master P., a young gentleman, of fair complexion, fourteen years of age, is in a condition which, in some respects, closely resembles that of the last patient.

There are no morbid appearances observed in the ear or neighbouring organs.

He is very deaf, but capable of hearing those who speak slowly and distinctly to him. Although so deaf, he is distressed and confused by violent noises; a few days ago he attended a large meeting for the distribution of prizes to the distinguished boys of a great public school; in this assembly there was a great deal of noise and uproar, mingled with the applause of the moment; "by this he was much confused at the time, and rendered deafer than usual afterwards."

His speech is so very imperfect, and indistinct, that none but his own family, or those much accustomed to him, can understand what he says. He is unable to utter some of the elementary sounds of the English language, such as that of *th*, &c.

Although in this case the patient does not appear to have suffered from any disease of the auditory organ occurring since the time of his birth, there is a peculiarity in the aspect of the external meatus, which seems worthy of a short notice.

This canal is longer, and narrower than usual, suggesting the idea that the tympanum may be abnormally small, so as to approach, as it were, the condition of this part in some of the lower vertebrata, in whose ear it is not developed.

Dumbness until the age of Eight Years. Speech afterwards
acquired.

February 3, 1855.—J. D., æt. 9, could hear, but was nevertheless dumb during the first eight years of his life; soon after the age of eight he gradually acquired the power of speaking, and “can now talk very plainly.”

The patient is a fair-complexioned, fine-looking little boy; his parents are healthy, and it is not known that any hereditary association requires to be noticed in connection with the occurrence of his malady.

The mouth and nose present no abnormal appearances, the expression of the countenance is good, and the intelligence, from all accounts, perfect.

The visible parts of the auditory apparatus are in normal condition.

Neither the history of the case, nor the present state of the patient, suggests any satisfactory explanation of the long continued infantile or mute condition, of the former existence of which sufficient proof has been obtained.

Deaf, Dumb, and Blind. Congenital Deaf-Mutism. Deafness.

Defective Speech. Opacity of the Membrana Tympani.

Opacity of the Cornea.

March 29, 1855.—Robert R., æt. 7, is extremely deaf, with opacity of the membrana tympani on both sides, of two years' duration. Within the last twelve months the speech has gradually become defective;

words do not seem to have been lost, but their utterance is very indistinct.

Two months ago right side ophthalmia commenced, and vision is nearly lost on this side, from opacity of the cornea. The boy has not, upon the whole, a scrofulous aspect, but it nevertheless seems not improbable that tuberculosis should be regarded as the ground-work of his maladies.

March 25, 1856.—Soon after the above notice was written the little boy lost the sight of his left eye, from ophthalmia, as he had previously done that of the right.

The eyes have now improved very much; the opacity formerly existing in both corneæ has in great measure disappeared; this opacity was so dense that the pupil could not be seen on either side, so that at different times the patient was blind, first of one eye, and then of the other.

The mother of this patient has a younger sister, married, and now thirty-one years of age, who has a son nearly eight years old, (four months younger than his cousin, the subject of this notice,) of "sandy," or light complexion, who is deaf and dumb; the deafness in this case was congenital, no signs of hearing having ever been observed.

Although the ocular affection of Robert R. has improved, the mutism is worse than before, and the little boy is now to be placed in a Deaf and Dumb School.

Dumbness, from Cerebro-Spinal Disease.

November 14, 1854.—T. L., æt. 4 years, a little boy of dark complexion, with a well formed and somewhat large head, and a countenance which, upon the whole, bespeaks intelligence, had scarlet fever, two years ago, and the morbid actions then aroused, and which seem to have told upon the nervous system in an extreme degree, have left this poor boy a spectacle of deformity, emaciation, and suffering.

The most striking feature of the case is the position and aspect of the upper extremities, which do not hang down, or rest semi-flexed, like ordinary weakened limbs, nor are they brought forward, but both arms, in a state of rigid extension, are stretched to their full length behind the patient, placed nearly parallel to one another, and at right angles with the axis of the body; so that, at first sight, if we did not observe attentively the face of the patient, or notice which way it is turned, we might more readily suppose that

the arms were being constantly held up in front of the body than that they are involuntarily elevated and sustained behind.

Along with the complete retro-extension of the arms there is flexion of the fingers, and very close flexion of the thumb into the palm of the hand.

With the exception of the emaciation, the lower extremities may be said to be in normal condition ; the reduction in bulk, however, is so great, that shoes which tightly fitted the feet two years ago are now found to be much too large.

The total loss of use in the upper limbs is surprisingly compensated by the employment and adaptations of the lower ; the patient scratches his head, rubs his eyes, and picks his nose with his toes, and shakes hands with his foot, if a pedo-manual act may thus be spoken of.

The upper extremities have had their present position during the last eight months, previous to which they took, at different times, various postures ; at one time pendant, with the palm of the hand on the outer side of the thigh, at another the fore-arm was flexed, and the closed fists approximated beneath the chin, and pressed against the larynx, so that the father of

the little boy was compelled forcibly to extend the fore-arms, and then tie the wrists in some less dangerous position ; now and then the hands would unite behind ; and each of these attitudes, if not interfered with, was occasionally maintained for a considerable time, until the present and more lasting position was arrived at.

In speaking of the occurrences of the case, the parents say that the child was attacked by fits, about three weeks after the commencement of the scarlet fever, the affection of the arms then came on, and about this time he entirely lost his speech, and afterwards remained completely dumb, without any structural disease then observed in the organs of respiration, voice, or articulation ; he did not suffer in the throat, or ear, and his hearing was never lost, and not even lessened in acuteness.

The respiration is observed to be abnormal, the thoracic parieties moving but to a very limited extent, so that the affection of the nervous centres, from which the boy seems to suffer, tells at once upon the apparatus of respiration and speech, as well as upon the upper extremities.

The loss of speech is relatively but a small part of this case, it is, however, interesting in many points

of view, of which the widely-spread disturbance of the motor apparatus is not the least remarkable ; sensation, the while, being preserved, as far as can be ascertained, in all the parts affected.

It would be useless to attempt an outline of the probable pathological changes with which the phenomena here detailed are associated ; they suggest the idea of softening of the nervous centres, which may possibly have been influenced by the tubercular dia-thesis ; alterations of the cerebro-spinal membranes, with, or without effusion, may also have occurred ; cerebral softening, or abscess, affecting the nerves of the tongue, may be mentioned as one of the possible conditions, and hence it may be remarked, that the fine nervous associations, necessary to speech, may, it would seem, be destroyed, and yet the non-articulating motions of the tongue continue to be performed.

The above remarks were put down on the 14th November, immediately after the patient came under my notice for the first time ; on the 15th, or the following day, he died, and a *post-mortem* examination was made on the 17th, at 8 a.m.

The brain was of normal appearance on its exterior, saving that it seemed less vascular than usual ; the

ventricles contained serous fluid, but were not distended or stretched by it; perhaps the whole of the fluid within the skull might amount to a couple of ounces; a small quantity, about half an ounce in all, of the same kind of pale serous fluid was found in the spinal canal.

The corpus callosum, the fornix, and smaller cerebral commissures were all peculiarly soft; the posterior lobes of the brain, on both sides, presented a condition of ramollissement, the exterior of this part of the brain giving way, and falling to pieces as soon as it was moved, and the white matter thus exposed having a consistence little greater than that of cream.

The soft condition of the nervous matter of the spinal cord was very remarkable.

The upper third of the spinal cord seemed abnormally large, its ordinary relative size being borne in mind.

The most striking morbid feature observed in this examination was the aspect of extreme vascularity presented by the parts observed on opening the vertebral canal; bloody effusion lined the bony tube of the spine, coating the outer or cellular surface of the theca vertebralis, so that the condition observed would

not be too strongly alluded to if we spoke of a tube of bone, a tube of blood, and next a theca or tube of membrane, one within the other; while the contained cord did not display any corresponding condition of hyperæmia.

The bloody effusion coating the exterior of the vertebral theca presented a gelatinous appearance, as if made up of jelly stained by blood, without any aspect of organisation from vessels running into it, which the naked eye could detect.

In observing the morbid conditions just noticed, the comparatively soft state of the nervous centres in very young subjects, as well as the effects of position and time on *post-mortem* appearances, require to be borne in mind.

Some of the appearances seen within the spinal canal very much resembled what I have more than once observed in the autopsy of cases of tetanus.

Mutism, without Deafness.

August 22, 1854.—Mary H., æt. 7, is dumb; she is a dark-complexioned little girl, who has always enjoyed good health.

When about eighteen months old, it was found that no attempt at speaking was made, beyond saying "dada," and "mamma," and the mother became the more concerned, inasmuch as her previous children had spoken at an earlier age, or when about twelve months old.

There is no abnormal anatomical condition to be observed in connection with any of the organs of sense; the tongue, as an organ of taste, is believed to be in healthy condition, and its ordinary motions are active; there is no symptom of lingual or other paralysis. The hearing is good. The organ of vision is healthy.

For the mutism in this case there is no adequate cause apparent: about three months after the patient was first seen she had become somewhat emaciated, was feeble, and irritable, and her general aspect suggested the idea that some cerebral disturbance prevailed.

Mutism, without Deafness.

*October 5, 1855.—*Thomas J., æt. 11 years, a healthy-looking boy, of fair complexion, with blue eyes, and with a head and face of normal formation, has

good hearing, but hitherto all efforts to teach him to speak have been unavailing ; his sister states that he can utter three words—"yes," "no," and "Billy;" of these the "no" is most easily uttered, the "yes" and "Billy" very imperfectly. The patient perceives the slightest noise, and evidently appreciates the source, or direction, as well as the intensity of sound.

It does not appear that there is any morbid condition which can be *adequately diagnosed* in connection with the cranium, or face, with the nervous centres, nerves, or organs of sense.

The generality of cases of congenital deaf-mutism, viewed in connection with their primary condition, are, in these days, reduced to cases of simple deafness, although, in early times, the opinion prevailed, that, in such cases, the patient suffered from paralysis of the organs both of hearing and of speech.

In the case just related it is evidently quite possible that the patient might have suffered from congenital deafness ; had this been so, two different and distinct causes of dumbness might have co-existed ; the one preventing the hearing of speech, the other not allowing of its utterance.

It may be that such co-existence of two causes of

mutism now and then prevails ; and it is probable that if the congenital deafness, in such circumstances, were complete, the other cause of dumbness would commonly escape detection.

One interesting question relating to such matters is, whether or no there be any connection between these two sources of defect ; and hence all facts which seem at all to help us towards the solution of such a question may be regarded as at once interesting and important.

It is not very uncommon to find several cases of congenital deaf-mutism in the same family, and, in such families, acquired deafness is by no means rare ; now it would be exceedingly curious if dumbness, without deafness, were also from time to time met with in families of this kind ; it would tend to shew that some morbid state prevailed, capable of affecting the ear without otherwise injuring the powers employed in speech, and also capable of preventing the acquisition of speech without damage to audition ; and, possibly, capable also of telling primarily upon both faculties in one and the same individual.

A fact relating to the little boy whose case has just been noticed may be regarded as worthy of mention

in connection with such considerations. A maternal aunt of this boy, now twenty-seven years of age, is deaf and dumb; the deafness was congenital: she has been during four years an inmate of a Deaf and Dumb Institution. Thus we find that a female has a deaf and dumb sister, and a hearing, but dumb son, the defects, in both cases, being regarded as congenital.

It is not improbable that, in cases of this kind, the development of the lingual, or motor nerve of the tongue, may be somewhat influenced by want of employment in the active movements of speech, and this seems to suggest a good reason for not readily relaxing our efforts in the attempt to bring the tongue into full play by teaching the practice of articulation; by action, the organic apparatus may be improved in strength, and all its adaptations and functions thus aided; at least, this may be regarded as true in those cases where the obstacles to the attainment of speech are not insurmountable.

Mutism. Loss of Hard Palate.

Mr. Peter B., æt. 40, a strong and healthy-looking man, who formerly enjoyed a perfect condition of the

organs of speech, had the misfortune, a few years ago, to lose a part of the bony framework of the nose, as well as a great portion of the hard palate; mainly, as it would seem, from the effects of mercury.

Hence he is unable to speak, or, in other words, is rendered dumb, having lost the power of dividing and modifying the voice by the apparatus of articulation.

Of his sufferings he thus writes:—“Without the artificial palate, I cannot articulate at all; I cannot speak so much as one word intelligibly; if long deprived of it, I get giddy and faint: with the artificial palate (made by Mr. Francis Thomson, surgeon-dentist, of Glasgow, to whom I was recommended by Professor Hannay,) I can speak perfectly.

In this case, the artificial piece is of considerable size, supplying a complete substitute for the hard palate, closing the communication with the nose, and finished with the adaptation of the required teeth, the incisors it holds in front looking better, it is probable, than their predecessors, the original teeth, did.

The statement of the patient respecting the effects produced by the apparatus are fully borne out by the most careful observation.

This case does not, in strictness, belong to our

subject; it nevertheless throws light upon one of the mechanical causes of dumbness, and suggests the importance of attending to the general condition, but more especially to the position, and form, of the hard palate, in all cases of imperfect speech, or mutism.

Concluding Remarks.

Cancerum oris, sloughing sore throat, and various other complaints of the mouth and pharynx, (as well as of the bones of the face, and skull, but more especially of those at the base of the cranium,) such as now and then follow bad, and typhoid forms of fever, or the exanthemata, are peculiarly worthy of attention in connection with the study of diseases of the ear, as well as with that of the fatal maladies, cranial, cerebral, or cervical, which occasionally follow in the train of these affections; and any disease of this, or of any other class, which gives rise to sanguous or purulent collections, near to the angle of the jaw, where such morbid products may be confined by the fasciæ of the neck, should be carefully watched, and not allowed to progress too long

without surgical interference, lest irreparable damage be done to one or more of the important structures in this region.

Scarlet fever, and its varied, and serious consequences, have been so frequently alluded to in the foregoing pages, that we cannot fail to see the special, and great importance, of this complaint, in its relations to diseases of the ear, and their possible effects upon hearing and speech: if further allusion to this matter might be permitted, the two following cases seem worthy of mention; the former in connection with mutism, the latter with those fatal ravages which are sometimes made by the sequelæ of scarlet fever, and which, in preceding notices, have been touched upon.

Mary G., æt. 3 years, a blue-eyed and fair-complexioned child, looks tolerably healthy, but is dumb; she had made some little progress in incipient articulation previous to an attack of scarlet fever, which occurred six months ago, and which was followed by disease of the left temporal bone; this disease is now progressing, more, it is to be hoped, in the external than the cerebral direction: the range, however, which it may possibly take along the petrous portion of the temporal bone, towards the more central part of the

base of the skull, is not capable of being determined with precision.

The mother of the patient states that since the occurrence of this malady all her speech has left her, although she seems to be quick of hearing on the right side, where there is no apparent alteration in the auditory apparatus.

Necrosis of part of the temporal bone has occurred, of which a small *black portion* has been removed by way of the left meatus externus; on this side the structures of the tympanum are probably broken up, although the condition of the meatus does not permit of this fact being determined by ocular inspection.

In these cases of disease of the temporal bone life is often endangered, and may be lost by affections of the nervous system, with, or without convulsive attacks, or from the ulcerative opening of vascular trunks, and this without the separation of any great portion of necrosed bone; on the other hand, the whole, or nearly the whole, of the superior maxilla, is sometimes separated from the remaining bones of the face, in cases such as are now contemplated; in some instances requiring removal by way of the mouth, in others in the external direction, or by way of the

partly lost cheek, after which the patient may recover with less of deformity than might have been expected.

In connection with the loss and want of speech in the case just noticed, the question occurs as to whether lesion of the lingual, or other cerebral nerve, at the base of the skull, may have taken place.

In the other, and more serious case, that of a boy, eleven years of age, after scarlet fever, abscess occurred in the upper part of the neck, on the right side, the matter of which was discharged by an opening between the thyroid cartilage and the anterior border of the sterno-mastoid muscle.

After ten days, from the upper part of the internal jugular vein, which had given way, blood was poured into the region of the abscess, so as to distend the integument on the side, and even towards the back, of the neck.

The patient lived upwards of a fortnight after the occurrence of this haemorrhage, and sank, at last, from debility, helped on by diarrhoea.

From the study of this case, side by side with the one noticed at page 63, we see that a very little difference in the position of the opening into the venous system might have produced a case of apo-

plexy, instead of one of hæmorrhage into the neck in the former case the lateral sinus gave way, in the latter, the continuation of it in the upper part of the internal jugular vein; such being the source of the bleeding, in this instance, it was, after due consideration, and consultation, thought well to arrest it by a hard compress of sponge, which was thrust firmly towards the foramen lacerum jugulare, after previous opening of the integument and fasciæ of the neck, and the removal of the great mass of blood thrown out beneath them. After the application of this compress there was no farther bleeding of importance, and it was removed on the fifth day, without any return of hæmorrhage.

It is easily understood that, in a case of this kind, the vascular system might have escaped, and the nerves in this part might have suffered, and as we have both the pneumo-gastric and the lingual close at hand, injury sustained by the latter might have told upon the motor power of the tongue, and thus upon the faculty of speech; for, even alteration of the nutrition, and hence of the vital condition of this nervous chord (on one side), might have sufficed, without its complete division, for the production of

a serious injury to articulation, if not of the dumb state, and this in a case where audition might have remained uninjured, as it did in this remarkable instance.

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BY THE SAME AUTHOR.

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